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EEI BULLETIN

• SEPTEMBER 1959 •

A Working Stockholder Relations Program

Carl J. Forsberg

Applied Citizenship at Detroit Edison

S. F. Leahy

Human Relations and Accident Prevention

W. E. Montgomery

Conclusions on Harvard Research Project

PUBLISHED BY EDISON ELECTRIC INSTITUTE

ELECTRICAL RESEARCH STATISTICS
THE ELECTRIC LIGHT AND POWER INDUSTRY

Current Statistical Data Covering 100 Per Cent of Industry

(Includes Investor-Owned Companies, Cooperatives, and Government-Owned Utilities)

April 1958-1959

SOURCE AND DISPOSAL OF ENERGY—MONTH OF APRIL

	1959	1958	%
NET GENERATION* (Kwhrs in Thousands)			
By Fuel Burning Plants	43,636,893	36,490,540	+19.6
By Water Power Plants	12,170,142	12,998,800	− 6.4
Total Generation	**55,807,035**	**49,489,340**	**+12.8**
ADD—Net Imports Over International Boundaries	309,992	308,933	+ 0.3
Less—Company Use	162,349	153,989	+ 5.4
Less—Energy Used by Producer	1,393,142	933,460	+49.2
Net Energy for Distribution	**54,561,536**	**48,710,824**	**+12.0**
Lost and Unaccounted for	4,127,340	3,522,657	+17.2
Sales to Ultimate Customers	**50,434,196**	**45,188,167**	**+11.6**

CLASSIFICATION OF SALES

NUMBER OF CUSTOMERS—As of April 30th			
Residential or Domestic	49,486,705	46,987,686	**
Rural (Distinct Rural Rates)	.....	1,649,400	**
Commercial or Industrial:			
Small Light and Power	6,489,058	6,217,387	**
Large Light and Power	341,893	307,521	**
Other Customers	190,728	183,661	+ 3.8
Total Ultimate Customers	**56,508,384**	**55,345,655**	**+ 2.1**
KILOWATTHOUR SALES—During Month of April (Kwhrs in Thousands)			
Residential or Domestic	14,465,532	13,144,312	**
Rural (Distinct Rural Rates)	.....	727,783	**
Commercial or Industrial:			
Small Light and Power	8,870,279	7,698,863	**
Large Light and Power	25,131,458	21,814,127	**
Street and Highway Lighting	453,798	422,758	+ 7.3
Other Public Authorities	1,150,236	1,019,929	+12.8
Railroads and Railways	307,081	325,650	− 5.7
Interdepartmental	55,812	34,745	+60.6
Total to Ultimate Customers	**50,434,196**	**45,188,167**	**+11.6**
Revenue from Ultimate Customers (Thousands)	**$842,723**	**$776,473**	**+ 8.5**

RESIDENTIAL OR DOMESTIC SERVICE

AVERAGE CUSTOMER DATA—for 12 months ended April 30, 1959			
Kilowatthours per Customer	3,442	3,264	**
Average Annual Bill	$86.74	$82.91	**
Revenue per Kilowatthour	2.52¢	2.54¢	**

* By courtesy of the Federal Power Commission.

** 1959 not comparable to 1958 due to Rural being in process of reclassification.

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THE EDISON ELECTRIC INSTITUTE BULLETIN is published monthly, except bi-monthly in July and August, by the Edison Electric Institute, an association of electric light and power companies in the United States and its territorial possessions. Its affiliate members consist of private electric utilities in North, Central and South America and contiguous islands in the Western Hemisphere.

The objectives of the Edison Electric Institute are:

The advancement in the public service of the art of producing, transmitting, and distributing electricity and the promotion of scientific research in such field.

The ascertainment and making available to the members and the public of factual information, data, and statistics relating to the electric industry.

To aid its operating company members to generate and sell electric energy at the lowest possible price commensurate with safe and adequate service, giving due regard to the interests of consumer, investor, and employee.

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CONVENTIONS AND MEETINGS

1959

SEPTEMBER

7-10 Illuminating Engineering Society National Technical Conference, Fairmont & Mark Hopkins Hotels, San Francisco, Calif.

11-12 The Maryland Utilities Association Annual Fall Conference, The Cavalier, Virginia Beach, Va.

14-15 EEI Electric Space Heating & Air Conditioning Committee, Akron, Ohio

14-15 EEI-AGA 1959-1960 Accounting Division & Section Organization Meetings, Hotel Cleveland, Cleveland, Ohio

14-16 EEI Meter and Service Committee, Hotel Wentworth, Portsmouth, N. H.

15 ECAP Copy Group Meeting, Philadelphia, Pa.

16-17 PIP Workshop Conference, Warwick Hotel, Philadelphia, Pa.

16-18 AIEE-ASME Engineering Management Conference, Statler Hotel, Los Angeles, Calif.

17-18 EEI Commercial Cooking and Water Heating Committee, Normandy Motor Hotel, Minneapolis, Minn.

17-18 EEI Home Service Committee, EEI Headquarters, New York, N. Y.

17-18 EEI Industrial Power & Heating Group, Treadway Inn, Niagara Falls, N. Y.

17-19 Public Utilities Association of the Virginias 41st Annual Meeting, Greenbrier Hotel, White Sulphur Springs, W. Va.

18 Oklahoma Utilities Association Gas Division Meeting, Biltmore Hotel, Oklahoma City, Okla.

21-22 EEI Sales Division Executive Committee, Roosevelt Hotel, New York, N. Y.

21-23 EEI Industrial Relations Committee Twelfth Annual Round Table Conference, Drake Hotel, Chicago, Ill.

24-25 Missouri Valley Electric Association Accounting Conference, President Hotel, Kansas City, Mo.

27-
Oct. 1 AIEE-ASME National Power Conference, Muehlebach Hotel, Kansas City, Mo.

28-
Oct. 2 ASME-AIEE National Power Conference, Kansas City, Mo.

28-30 NELPA 52nd Annual Meeting, Hotel Vancouver, Vancouver, B. C.

30-
Oct. 1 52nd PEA Annual Meeting, Bellevue-Stratford Hotel, Philadelphia, Pa.

OCTOBER

1- 2 EEI Transmission and Distribution Committee, Rice Hotel, Houston, Tex.

5- 6 EEI Electrical System & Equipment Committee, Hotel Muehlbach, Kansas City, Mo.

5- 7 AGA Annual Convention, Conrad Hilton Hotel, Chicago, Ill.

7- 9 Missouri Valley Electric Association Sales, Rural & Home Service Conference, President Hotel, Kansas City, Mo.

7- 9 Indiana Electric Association Annual Convention, French Lick-Sheraton Hotel, French Lick, Ind.

8- 9 EEI Electric Power Survey Committee, EEI Headquarters, New York, N. Y.

11-16 AIEE Fall General Meeting, Morrison Hotel, Chicago, Ill.

11-16 ASTM 3rd Pacific Area National Meeting, Sheraton-Palace Hotel, San Francisco, Calif.

12-14 EEI Prime Movers Committee, Barringer Hotel, Charlotte, N. C.

12-15 NARUC Convention, Bellevue-Stratford Hotel, Philadelphia, Pa.

14-16 Wisconsin Utilities Association Operating & Sales Convention, Schroeder Hotel, Milwaukee, Wis.

15 Oklahoma Utilities Association Electric Light & Power Division Meeting, Western District, Lake Murray Lodge, Ardmore, Okla.

15-16 EEI Insurance Committee, Hotel Somerset, Boston, Mass.

15-16 Southeastern Electric Exchange Engineering & Operation Section, Fall Meeting, Biltmore Hotel, Atlanta, Ga.

16 Oklahoma Utilities Association Electric Light & Power Division Meeting, Eastern District, Aldridge Hotel, McAlester, Okla.

20-22 EEI Area Development Committee, Westward Ho Hotel, Phoenix, Ariz.

21-22 Electrical World Fourth Electric Heating and Heat Pump Conference, Chase-Park Plaza Hotels, St. Louis, Mo.

21-23 EEI-AGA Taxation Accounting Committees, Hotel Leamington, Minneapolis, Minn.

22-23 EEI Statistical Committee, The Homestead, Hot Springs, Va.

22-23 Southeastern Electric Exchange Accounting Conference, Shoreham Hotel, Washington, D. C.

23 Oklahoma Utilities Association Accounting Section Meeting, Jens-Marie Hotel, Ponca City, Okla.

25-29 Rocky Mountain Electrical League 56th Annual Fall Convention, Broadmoor Hotel, Colorado Springs, Colo.

NOVEMBER

4- 6 New Jersey Utilities Association Annual Meeting, Seaview Country Club, Absecon, N. J.

5- 6 Pacific Coast Electrical Association, Hawaiian Conference, Matson House, Honolulu, Hawaii.

9-11 EEI Accident Prevention Committee, The Dennis Hotel, Atlantic City, N. J.

9-11 AEIC Annual Meeting, Boca Raton, Fla.

9-13 NEMA Annual Convention, Hotel Traymore, Atlantic City, N. J.

12-13 Electric Council of New England Third Annual Conference, Hotel Somerset, Boston, Mass.

12-13 PEA Transmission & Distribution Committee Fall Meeting, Penn Alto Hotel, Altoona, Pa.

16-18 Southeastern Electrical Exchange Sales Section, Roosevelt Hotel, New Orleans, La.

17-19 Building Research Institute Fall Conferences, Shoreham Hotel, Washington, D. C.

18-20 Ohio Power Company Inter-Industry Farm Electric Utilization Council Annual Conference, Westward Ho Hotel, Phoenix, Ariz.

19-20 AGA Managing Committee Meeting, Westward Ho Hotel, Phoenix, Ariz.

29-
Dec. 4 ASME Annual Meeting, Atlantic City, N. J.

30-
Dec. 2 EEI-AGA Electronics Seminar, St. Francis Hotel, San Francisco, Calif.

A Working Stockholder Relations Program

By Carl J. Forsberg
President, Wisconsin Power and Light Co.

THERE are unlimited possibilities to the effective support stockholders can give your company, and which your company can give to stockholders, when there is a medium through which to communicate with one another.

Wisconsin Power and Light Co. has such a medium in its 14 stockholder committees, one for each of its operating districts. Through these committees, management is in close touch, as it has been for the past 25 years, with approximately 28,000 Wisconsin stockholders.

As a result, stockholders and management of WP&L are working partners, and this mutual-relations program brings benefits to both parties.

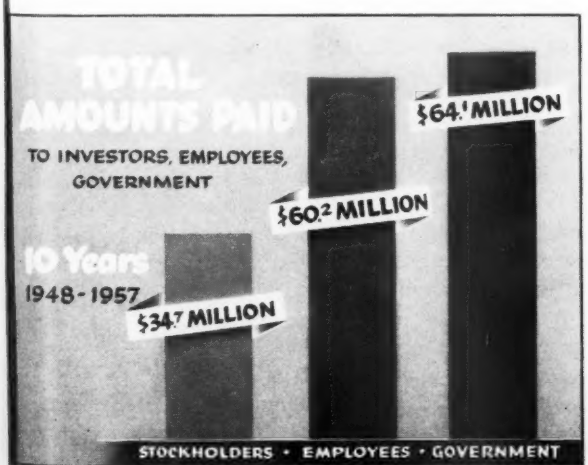
Basically, the arrangement is not solely insurance to ward off troubles; there are many company affairs which management and stockholders discuss that have a pleasant and progressive connotation. Both groups are vitally essential to the company, and by means of the committees have come to know each other well.

The company's success in communicating with its stockholders and in maintaining interest and enthusiasm in company affairs is the story of a long-time stockholder relations program started about 25 years ago.

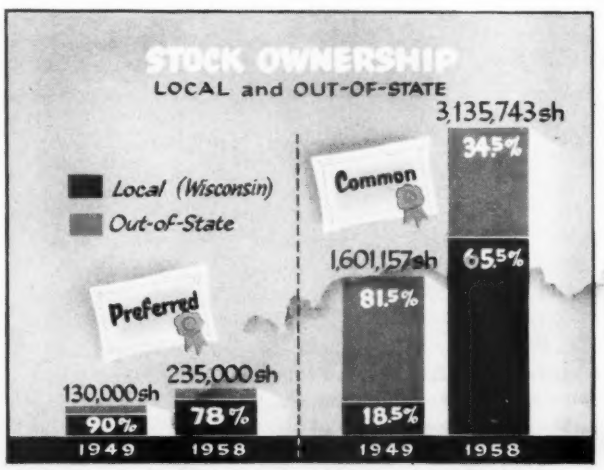
In the early 1930's, Wisconsin Power and Light's affairs were at a very low ebb, a condition which was generally shared by the industry. The common stock was held entirely by the holding company, while about 80 percent of the preferred stock was held by persons living in Wisconsin, many of whom were also customers of the company.

Because of the depreciated condition of the market, the company's preferred stock had dropped to about 15 percent of its par value, and dividends had dwindled proportionately. Consequently, stockholders were greatly concerned about the future of their investments. Stockholder-customers had double trouble with the added worry of finding it difficult to pay their electric bills.

Added to these financial woes was a deliberate effort by the existing state administration to enact legislation creating a state-owned electric system. There was also a rash of municipal elections (22 of them) en-



WP&L's 1958 presentation to stockholders included such information as total amount paid to stockholders, employees and government, 1948-1957; and local and out-of-state ownership of stock for years 1949 and 1958.



couraged by the state government. It is evident that there were plenty of problems facing the company's stockholders and management.

There was only one thing to do—face the stockholders with facts and tell them the company's problems without reservation. It was felt that this soul-searching would bring understanding, appreciation and support of the company's position. The guess was right. Meetings were held in each of the utility's 14 operating districts, and every meeting was well attended.

Stockholders were told why they were not receiving a full dividend, and that they could help to improve the company's income by encouraging greater use of electricity.

They also were fully briefed on the adverse political climate under which Wisconsin utilities were laboring, and were told that they could combat the trend toward municipal ownership by presenting the facts to the public about the company.

In order to have effective contact with the stockholders, committees ranging in size from six to 20 members were organized in each operating district to represent the interests of all stockholders of the area, and serve as a liaison between the company management and the stockholders.

The problem of low income and partial dividend payments was the first to be considered after the management-stockholder meetings were started in the 1930's. Stockholders began to practice and to advocate increases in the use of electric service. The financial position of WP&L began to show improvement.

Support from Stockholders

Then, being threatened with the loss of customers and property through municipal elections, the company received enthusiastic and vital support from stockholders in focusing attention of the public on the benefits of utility company service. As a result of this action not a single franchise was lost.

Another immediate result of this relations program was stockholder development of sufficient opposition to the Wisconsin Development Authority Bill, then before the Wisconsin state legislature, to help bring about its defeat.

Since inception of the stockholder relations program, meetings between company management and the district committees have been held once or twice yearly. Company affairs are discussed frankly, questions are answered, committee members often make suggestions, and often they pass on to management information that is important to the company. Each meeting is fully reported to all stockholders of the district in a letter sent out over the signatures of the stockholder committee. Districts in the company cover from 7,300 to 17,000 residential and rural meters, and from 540 to 1,985 stockholders. General stockholder meetings have been held periodically in which company progress, plans and positions have been presented through talks and displays.

In addition to consideration of basically local matters, the committees and other stockholders have taken positions on national problems, such as Hell's Canyon, Niagara Falls, highway relocation, IRS ruling, TVA financing, REA interest, and others.

Stockholder committees also have followed with interest the company's advertising and merchandising programs, its public relations events, its construction program, the progress and effect of inter-connection and cooperation with neighbor companies, and, of course, the service and financial progress of the company. Over the years, stockholder committee members have become well acquainted with the workings of Wisconsin Power and Light, and have shared this knowledge with all of the stockholders they represent.

Distribution of Stock

Until 1948, the company's common stock had been wholly owned by the holding company, although the preferred stock already was largely owned in Wisconsin. With distribution of the common stock, only about 18.5 percent of it found its way into Wisconsin. The company felt that it would be an important advantage to increase this percentage. This was discussed with stockholder committees.

There was steady improvement in the home-ownership statistics. By 1950, 34.5 percent of the common shares were owned by Wisconsin residents. In 1952, the halfway mark—or 50 percent home-ownership point—was reached, and since then the percentage figure has climbed steadily until the ownership of the company's common stock in Wisconsin at the end of 1958 was 65.5 percent.

The preferred stock ownership in Wisconsin has been consistently at approximately 80 percent.

Most gratified with the results of its stockholder relations program, WP&L sought to give expression to its objectives in a statement of principles which it calls the Four-Fold Goal. Furthermore, management lives up to its written objectives, and stockholders are helping the company to meet these goals, which are:

- Customers—to provide the best in utility service at the lowest equitable rates for the territory served.
- Employees—to maintain the best working conditions and the highest wages in keeping with the size of the community and the success of the company.
- Stockholders—to earn and pay to the stockholders the fair return on their investment to which they are entitled.
- Communities—to be a worthy member of each community we serve.

General Meetings Held

In 1958, as a continuing part of the stockholder relations program, emphasis was put on a series of general stockholder meetings. This was decided upon because of awareness that despite the efforts of the company officers, working through the committees, there probably were many stockholders who did not know the company intimately through contact with elected officials.

It was decided that it is important to stockholders to know the facts about the company in which they have invested, the significance of its growth in the past, its plans for the future, and some of the current problems facing the company and the industry. Above all, it was felt that personal acquaintance with company officers, all of whom had been elected to their present positions

since 1952, was very important in stockholder relationship.

For a central theme, the slogan, "People, Power, Progress," was chosen. This seemed to sum up the basic principles or concerns of the utility industry, and it served as a central theme toward which each speaker could point his remarks.

The reports to stockholders were comprehensive and complete, and were presented by the president and three vice presidents with the aid of charts, graphs, slides and photographs in a carefully designed display. Unlimited time was given for questions, and answers were given frankly. A refreshment hour at conclusion of the meetings provided additional time for stockholders to meet the company officers and to discuss company business.

The result of these meetings has been a marked increase in support of the company and an increase in interest of stockholders. Seventeen general stockholder meetings were held in the state with 6,000 attending, or 21 percent of the area stockholders. They gave a resounding endorsement of the company, its management and the economic principles for which it stands.

Committee Organization Successful

Again, it was through the stockholder committee organizations that Wisconsin Power and Light was able to conduct such a successful stockholder program in 1958. Both company management and stockholders realize the usefulness of the present committee organization, and that they benefit mutually. Both are anxious to have it continued.

C. C. Herrmann, second from left, WP&L Vice President, discusses company matters with stockholders.

The stockholder relations program is an important element in the strength of the company. It gives management the feeling that in Wisconsin, where its sphere of action lies, it can rely on the support of a large segment of its stockholders to support its actions and its judgments.

Stockholders, in turn, are gratified to have an important part in a home industry and to have the confidence and concern of management which shares its plans and problems with them.

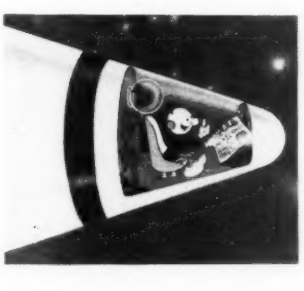
800 Expected at PEA Meeting

NEARLY 800 representatives of electric utility companies are expected to attend the 52nd annual meeting of the Pennsylvania Electric Association in Philadelphia, Sept. 30-Oct. 1.

"Electricity, Keystone of Progress" will be the theme of the meeting, which will be held in the Bellevue-Stratford Hotel, PEA President A. D. Root, Vice President of Pennsylvania Power & Light Co., has announced.

In announcing the program, Mr. Root said, "The very fact that electricity *is* the keystone of our progress brings with it a sober responsibility for extra care, extra thought, extra vigilance in bringing this service to our customers . . . The annual meeting has been tuned to give us added awareness of how we can best carry out this immense obligation."

Speakers will include Allen S. King, President of EEI and President of Northern States Power Co.; Chas. E. Oakes, Chairman of the Board, and Jack K. Busby, President, of Pennsylvania Power & Light Co.; Philip A. Fleger, Chairman of the Board and President of Duquesne Light Co.; James F. Fairman, Vice President of Consolidated Edison Co. of New York, Inc.; the Hon. Park H. Martin, Secretary of Pennsylvania Department of Highways; Dr. Millard E. Gladfelter, President of Temple University; and Dr. John H. Furbay, head of Trans World Airlines' global education program.



Reddy Stars in Film on Atom

"The Mighty Atom," Reddy Kilowatt's new 16mm color film, now is available, Ashton B. Collins, President, Reddy Kilowatt, Inc., announced recently.

Presented in full animation with complete musical score, "The Mighty Atom" tells the story of electricity, from amber to atoms, with Reddy himself in the starring role. The film, developed for presentation to a wide range of audiences, is designed to convey the full meaning of the industry theme—Live Better Electrically. The 17-minute film was produced for Reddy Kilowatt by the John Sutherland Productions, Hollywood.

A variety of supplemental material has been prepared for use in conjunction with film showings. These include a 36-page color cartoon story book; a 16-page stamp album, complete with full-color stamps; a folder containing a glossary of many electrical and atomic terms.

Requests for detailed information on the "Mighty Atom" should be made directly to: Reddy Kilowatt, Inc., 750 Third Ave., New York 17, N. Y.

Three-Day Meeting in Chicago Will Have as Its Theme, 'Your Employee Relations Are Showing'

12th Round Table Conference to Be Held Sept. 21-23

THE 12th Annual Round Table Conference of the EEI Industrial Relations Committee, Sept. 21-23, in Chicago, Ill., will offer an analysis of employee relations from the viewpoint of the employee, the supervisor, the president and the customer and public.

W. H. Senyard, Louisiana Power & Light Co., and Chairman of the Industrial Relations Committee, will welcome the representatives.

Impressive Roster of Speakers

An impressive roster of speakers has been selected for the conference which will have as its theme, "Your Employee Relations Are Showing."

Charles Parker, President, Central Surveys, Inc., Shenandoah, Iowa, will discuss "Your Employee Relations are Showing to Your Employee." Mr. Parker will evaluate the status of employee relations as reflected in the attitude of employees, indicating areas in which the employees think the companies have excelled and those in which they think the companies have made unsatisfactory progress.

E. A. Casey, Manager, Labor Relations, West Penn Power Co., in his discussion of employee relations and the supervisor, will review past and current employee relations policies. This will include the duty of the supervisor to implement management policies in his relations with the "rank and file" employee.

"Your Employee Relations are Showing to Your President" will be discussed by J. R. Welsh, President, Southwestern Electric Power Co. Mr. Welsh will evaluate the success of electric utility companies in dealing with unions as indicated by number and types of grievances, arbitration cases, erosion of management prerogatives, wage increases and other matters.

How employee relations affect customers and the public will be reviewed by K. I. Jack, Vice President, Washington Water Power Co. Mr. Jack will point out how these policies may improve customer and community relations through the support of employee activities in various phases of community life.

Allen S. King, EEI President and President, Northern States Power Co., E. M. Naughton, President, Utah Power & Light Co., and G. C. Rawls, President, Louisiana Power & Light Co., will be the luncheon speakers on Monday, Tuesday and Wednesday, Sept. 21, 22, and 23, respectively.

A special panel discussion of "Meeting the Union Challenge for Employee Loyalty" will be held Tuesday, Sept. 22, at 8 p.m. in the Grand Ballroom of the Drake, with J. H. Westbrook, Personnel Director of West Penn Power Co., as moderator. The panel members will include: E. J. Brill, Director, Employee Relations, Pennsylvania Power & Light Co.; C. W. Caldwell, Vice President, Orange & Rockland Utilities, Inc., and S. F. Leahy, Vice President, The Detroit Edison Co.

Group conferences are scheduled for each day of the conference. The standard "How-to-Do-It" format which has proved very successful in former years will be followed.

The Hospitality Hour has been scheduled in the Grand Ballroom Monday, Sept. 21 at 8 p. m.

The Printed Materials Exhibit will cover the entire employee relations field, from recruitment to retirement, accenting the conference theme.

The Round Table Conference Committee includes J. H. Westbrook, Chairman, and D. C. Allen, Public Service Electric and Gas Co.; H. L. Bowen, Georgia Power Co.; William Ismay, Arizona Public Service Co.; O. P. Reed, Public Service Co. of Colorado, and F. E. Winchester, NEGEA Service Corp.

The following will participate in group conferences:

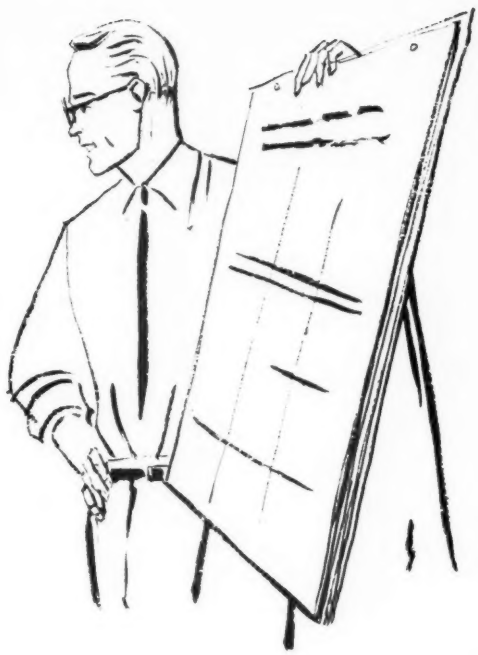
"To The Employee"—A. Howland, Director of Training—Rochester Gas & Electric Corp.; J. A. Mundy, Employee Relations Supervisor—Appalachian Power Co.; D. C. Wester, Director of Employee Relations—Kentucky Utilities Co.; J. O. Parker, Manager of Employment & Research—Central Hudson Gas & Electric Corp.; L. Anderson, Supervisor of Training—Tampa Electric Co.; W. Fagerstrom, Training Supervisor—Wisconsin Power & Light Co.; J. Shirey, Training & Safety Manager—Gulf States Utilities Co.; L. N. Talbott, Employee Relations Director—Central Illinois Light Co.

"To The Foreman"—C. W. Cornforth, Assistant Industrial Relations Manager—Public Service Electric & Gas Co.; J. H. Donnelly, Assistant Director, Personnel Research—Philadelphia Electric Co.; Z. J. Ambrose, Classification Analyst—Texas Electric Service Co.; M. Bateman, Supervisor of Training—Utah Power & Light Co.; N. L. Geer, Industrial Relations Manager—The Connecticut Light & Power Co.; R. A. Obenauer, System Personnel Representative — Niagara Mohawk Power Corp.; E. H. Luther, General Personnel Dev. Supervisor —Consumers Power Co.; M. Roach, Personnel Director —Central Louisiana Electric Co.

"To The President"—C. E. Jones, Vice President—

(*Continued on page* 322)

Applied Citizenship at Detroit Edison



By S. F. Leahy
Vice President, Employee Relations, The Detroit Edison Co.

THE time has come to stop talking about the decline of self-government and to try to do something about it. We at Detroit Edison believe the best way to do this is to encourage our employees to participate on a voluntary basis in citizenship activity in the party of their choice. Here is what we are doing to make it work.

All of us in our daily lives are surrounded by government on local, state and national levels. At home and at work its impact is tremendous—coloring almost everything we do and to a very large extent shaping the future. It is with the shape of things to come that we are deeply concerned. I am convinced that freedom as we have known it cannot survive unless there is a genuine return to the kind of citizen-involved self-government which has characterized our nation's past.

This means strengthening our two-party system at the grass roots level with larger numbers of more informed and responsible people in each party—eager, enthusiastic people who are determined to exercise their citizenship in a more effective and personally satisfying way. I believe people will become more effective politically when they become more aware of how they can be hurt legislatively.

To Retain Individual Freedom

Increased awareness and more grass roots participation are our best hope for turning back the growing influence of highly organized pressure groups and reversing the trends in our society which deny or abridge our individual freedom and initiative.

A good example of this trend is the case of Stanley Yankus. Under a 1938 law this Michigan wheat farmer was told how much wheat he could plant. When he planted more than his allotment, using the extra wheat only to feed his chickens, the Federal government fined him $4500. After fighting battle after battle over the principle involved, Yankus finally decided to sell his farm and leave the country.

One may agree or disagree as to whether Stanley Yankus was right in defying the law or wise in leaving the country, but few will deny that his personal fight has done much to dramatize the plight of the individual in dealing with the restrictions on individual freedom imposed by his government.

Encroachment in Electric Industry

Our own industry, of course, has felt the encroachment of big government more keenly than most. It is right in our back yards. With Federal power projects now furnishing electricity to one-fifth of our country's people, we have cause to know whereof we speak. Unfortunately, outside of our industry there is little recognition of this fact and almost no understanding of the danger it represents.

But big government is not just an electric industry problem; it permeates our whole economy. For example, the Federal government now employs 2,323,000 civilian workers, owns 19,000 small businesses and corporations, plus many service organizations.* They lose billions of dollars a year, but instead of going out of business, they simply chalk up a deficit and continue to operate on tax money. Many of the government corporations exist without constitutional authority.

* From *The Detroiter*, Jan. 5, 1959, published by Greater Detroit Board of Commerce.

Even more appalling is the terrible toll inflation and taxes have taken on individual personal incomes. A few examples from a recent magazine article illustrate what has happened to the purchasing power of your income:*

Inflation and You

1939		*1957*	*Why*	
Income	*Left after taxes*	*Same income after taxes worth only*	*Tax Increase*	*Inflation*
$5,000	$4,878	$2,051	$696	$2,131
10,000	9,536	3,877	1,632	4,027

Income Needed to Maintain Purchasing Power of 1939 Income

1939 Income	*Income needed in 1957*	*Income needed in 1975*
$5,000	$13,004	$33,240
10,000	30,971	92,141

These are disturbing facts and they hit home hard. We need more analyses of this kind to increase each individual's awareness of how big government affects him personally. The fact is, however, that there is very little awareness at the present time and we have a tremendous job to do.

Survey on Government, Business

Take for example the attitude of the young people of our nation. In a recent survey of high school students on the subject of government and business, 61 percent felt that government should control radio and television, 56 percent felt that government should be responsible for curing the economic ills of the country and 35 percent felt government should control basic industries such as steel, transportation, communications, and electric power. If this is really typical of our young people, what is going to happen a few years from now when they are placed in responsible positions in business and government?

Some people feel it is too late to tackle the problem of big government successfully. They feel it has grown too big and is too well entrenched for the individual citizen to do much good. With this sentiment we are in complete disagreement. It is because of the apathetic or defeatist attitudes of millions of individual citizens in the past that we face the problem we do today.

Under our system of representative government there are many things the individual can do to make his citizenship truly effective. Here are just a few:

- He can inform himself about taxes, budgets, proposed legislation and political candidates.
- He can tell his legislative representatives how he feels about these issues by writing letters.
- He can register and vote.
- He can contact personally his own district, county and state political party organization.
- He can join the party of his choice and work for what he believes in.

It is easy to say these things but how are employees motivated to do it? Our approach to solving this problem has two basic, interdependent aims: (1) to educate our people as to what applied citizenship really means, how it works and how one goes about getting active, and (2) to establish by words and by deeds the kind of company atmosphere which encourages employee participation as private citizens in political activity in the party of their choice.

Favorable Response

We began our applied citizenship activity by inviting 25 of our top-level management people to hear a presentation on this subject by Public Affairs Counsellors, Inc., of New York City. This presentation and the ensuing discussion lasted a full day and was received enthusiastically. As the result of the favorable response, the plan has been continued on a long-range basis. Since the first session, three additional two-day sessions have been held for other management and staff employees and again the response has been excellent. Particularly encouraging were such typical comments as "I know now that you don't have to be an elected official to do something" and "increased my desire to do more."

Our next step is to have Public Affairs Counsellors train 20 trainers from among company people. These trainers will, in turn, carry out the program in the company as more employees are involved. Teams of two trainers will lead applied citizenship discussions for groups of 20 employees. There will be one session a week over a period of 10 to 12 weeks. Each session will last two hours. These discussions will be available to all management and staff employees on a voluntary basis.

If the discussions continue to be successful, the company will probably make the program available to all employees. In the meantime, however, we are exploring employee requests to form citizenship discussion clubs. If this proves feasible, we will, upon request, furnish the clubs factual information, meeting space, and help them obtain speakers.

Company's Policy Statement

Meanwhile, so there will be clear understanding of the company's position on employee participation in applied citizenship activity, the company has issued a policy statement on this subject. Here are several excerpts:

"This General Order confirms the company's encouragement of active employee participation in citizenship activities in the communities we serve. It recognizes that good citizenship means more than casting a ballot. It means joining with others in discussion of the issues and taking part in citizenship activities at the grass roots level. Such activities provide many opportunities for exercising good citizenship without holding an elective or appointive office.

"To further encourage employee education and interest in citizenship activities, the company will sponsor education programs in applied citizenship for interested employees, on a voluntary non-partisan basis. An applied citizenship committee is . . . established to provide guidance for this activity.

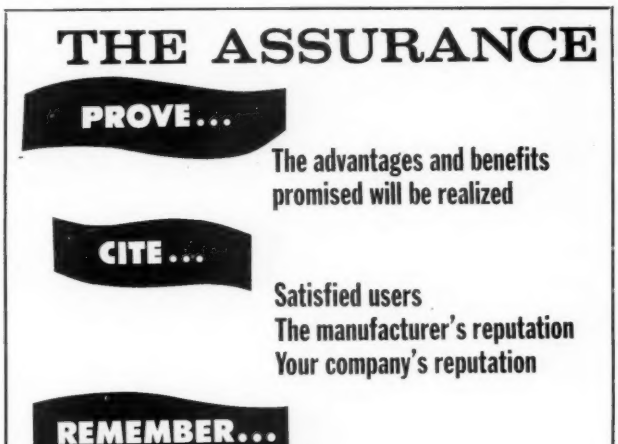
". . . The involvement of more individuals in applied citizenship activity is a necessary and effective step toward better government and a reversal of some of the present trends. In encouraging these activities, through

(*Continued on page* 315)

* From "Here's How Inflation Has Victimized You," by T. Coleman Andrews, *Reader's Digest*, March, 1959.

THE SOLUTION
Follow a definite plan
Make her aware of all the advantages and benefits of owning
Stress the many ways it meets her needs
Try to close

The four buying decisions—the Need, the Solution, the Assurance, and the Value—form the basis of the "Profit-Building Sales Training Course," now available from EEI. It was developed by the Institute's Sales Personnel and Training Committee and the Cleveland B. Chase Co., New York sales training consultant firm. Price is $99.50, FOB, Chicago.



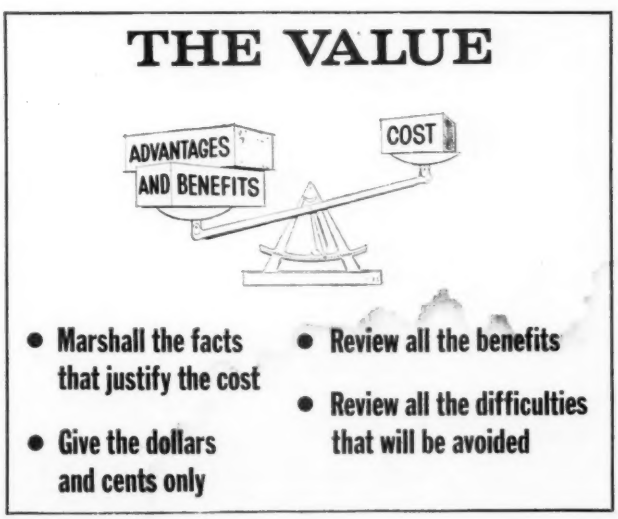
Appliance Sales Training Course Offered by EEI

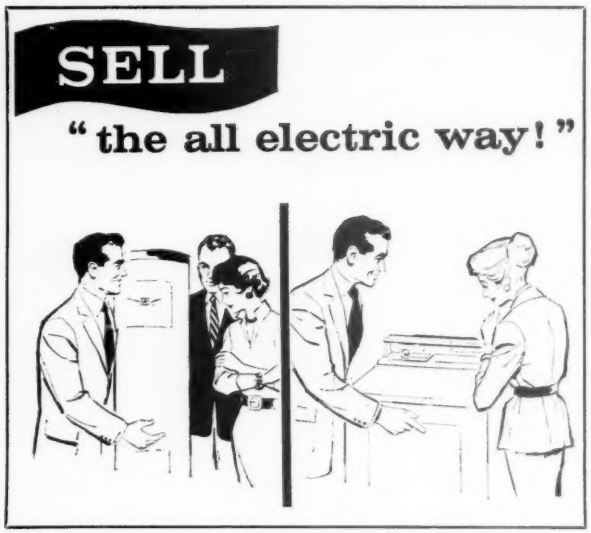
It Is Designed to Increase Sales of Electric Ranges, Water Heaters, Dryers and Refrigerator-Freezers

A "PROFIT-BUILDING Sales Training Course" designed to sell four major electric appliances now is available from Edison Electric Institute.

Based on the four buying decisions—need, solution, assurance and value—the course was developed by the EEI Sales Personnel and Training Committee and the Cleveland B. Chase Co., New York, sales training consultant firm.

The flexible, easy-to-use course has been designed to meet every type of training need. It provides the basis for a full-fledged training program. Individual units can be used to spearhead special promotions and campaigns. The course, which can be taken right into the store and used for sales meetings of all sizes, provides for sessions of 15 to 30 minutes, or two to three hours, depending on local needs. Comprehensive home-study materials also are provided for the salesmen.


THE VALUE
ADVANTAGES AND BENEFITS
COST
• Marshall the facts that justify the cost
• Give the dollars and cents only
• Review all the benefits
• Review all the difficulties that will be avoided



The EEI appliance sales training course which has just been made available offers five separate courses including basic selling principles and selling of appliances—range, dryer, water heater, refrigerator.

The five training sessions include:

- Basic Selling Principles
  Review of the principles of salesmanship presented in previous EEI sales training courses; use of prospect's dominant buying motive to gain the four buying decisions; getting the sales started; demonstrating; closing the sale.
- Selling the Electric Range
  How to capitalize on the growing acceptance of electric cooking; how to convince the prospective customer that the range is convenient, fast, modern, economical, easy, safe, dependable, healthful, clean, cool.
- Selling the Electric Dryer
  The dryer provides the same benefits as the automatic heater. How to convince the prospect that she needs a dryer; the advantages of the electric dryer over other types.
- Selling the Electric Water Heater
  How to present advantages and benefits; the market for electric water heaters; sizing heaters and estimating cost; differences in approach to the homemaker and her husband.
- Selling the Refrigerator-Freezer
  The new market for adequate refrigeration in the home; the advantages of the combination unit; how to sell the freezer; how to sell adequate refrigeration.

The course contains five sets of 10-page flip charts in color, one leader's guide for each of five subjects, 10 salesman's manuals for each subject, acetate "blackboards," and a sturdy easel carrying case. The leader's guides outline various methods of conducting meetings and the 16-page, illustrated salesman's manuals contain material for on-the-job and home study.

One of the greatest attributes of the course is that it is of equal interest to the novice or experienced salesman. The course will be available only to electric utility companies which, in turn, will be able to set up programs with dealers and distributors. Because it is in chart form, deletions and additions can be made simply and the course can be updated constantly. Whole new subjects can be added as needed.

G. W. Warner, Consumers Power Co., was Chairman of the Sales Personnel and Training Committee when the course was developed. He since has been succeeded by G. J. Steffen, Union Electric Co., as committee Chairman.

Orders for the course should be sent to Edison Electric Institute, Sales Division, 750 Third Ave., New York 17, N. Y. The price is $99.50, FOB, Chicago.

Zeuthen Heads Live Better Electrically Program

RALPH ZEUTHEN

RALPH ZEUTHEN has been appointed Program Manager of the Live Better Electrically program of EEI, Edwin Vennard, Vice President and Managing Director of the Institute, has announced.

Mr. Zeuthen will head the $2½ million Live Better Electrically program which was previously known as the National Electric Living Program. It includes promotional efforts in newspapers, magazines and TV, and has as its major activities HOUSEPOWER (wiring), Light for Living and the Medallion Home, which will be featured in the 30-page advertising spectacular in the Sept. 14 issue of *Life* magazine during National Home Week.

For the past two years, Mr. Zeuthen has been president of Zeuthen, Thomas & Hulbert, Minneapolis, Minn., advertising agency. Prior to that, he was vice president and assistant to the president of Campbell-Mithun, Minneapolis, handling public relations and supervising several accounts, including the advertising program of Northern States Power Co. and its promotion of HOUSEPOWER. He has also served as assistant director of public relations for Northwest Airlines, both domestic and international, and as a reporter on several Minnesota newspapers.

A native of Minneota, Minn., Mr. Zeuthen attended the University of Minnesota, studying journalism. He is married and the father of two daughters.

Mr. Montgomery Feels There Is a Correlation Between Human Relationships in the Working Environment and the Accident Frequency Rate

Human Relations and Accident Prevention

By W. E. Montgomery
Vice President, Southern California Edison Co.

A GREAT deal of the time, effort and energy of accident prevention people undoubtedly goes to the problem of trying to understand people and why they do things that they do. In many cases, after an accident has occurred, the question, "Why did this accident happen?" is really the question, "Why did these people do what they did?"

Likewise, in developing safety devices and establishing accident prevention rules and procedures this question must be answered: "What may people do and what can we do to protect them from the consequences of what they may do?"

You are directly concerned with protecting people from themselves or from each other. In order to accomplish this objective, you, too, have a paramount need to understand people.

I believe there is some correlation between the human relationships in the working environment and the accident frequency rate. It is doubtful if adequate statistical data are available either to support or contradict this hypothesis. From our experience and observations, however, we can advance some supporting argument.

Man Depends on Man

Man, more than any other animal, is dependent upon his own kind; he cannot exist alone. This interdependency, this basic necessity for living and working and playing together, is at the same time the source of our satisfactions and the cause of our conflicts.

We know that people affect each other and react to and interact with each other. We observe daily the effect of interpersonal relations both on and off the job. In living and working and playing together, we respond to each other in every subtle and minute variation from sublime love to murderous hatred. Interpersonal relations run the gamut.

We need go no further than the daily newspaper to collect incontrovertible evidence of the ambivalent character of human nature. Destructive interpersonal relations evoked by hate and utter selfishness, however, are apparently considered by editors generally to be more newsworthy. They are usually allocated to the front pages and the larger headlines.

Constructive, cooperative, productive effort between two or more people is also a manifestation of interpersonal relations. In the working group situation this condition is clearly recognized.

A Matter of Morale

As the efficiency and effectiveness of the working group increase, a subtle change or development in interpersonal relations often occurs simultaneously. The spirit or morale of the group is increased or elevated. There appears to be a correlation between group spirit or morale and group productivity.

High morale or esprit de corps is considered an important objective of leadership. But it is easier to recognize this particular condition of interpersonal relations within a group than it is to define it or to determine its origin. Perhaps this is because it is a feeling that exists within and between the individuals of the group. Our feelings seldom can be adequately verbalized.

In those groups where such desirable interpersonal relationships do exist, however, it is usually noted that a general feeling of love and respect exists between the people involved. They are usually interested in and concerned for the welfare of each other. I think this concern may well extend to the field of protecting each other from the hazards of the work. This, of course, is not a new idea and I am sure that all of us have already given much study to this hypothesis, but I wonder if there are not some implications here that will bear still more study.

What determines the kind of human or interpersonal relations that exist in an organization? Those in accident prevention work have already considered this question, also. In the final analysis, there is not much that those of you in a staff position can do directly to change the human relations within your respective company organization.

An address before the 67th Annual Meeting of the EEI Accident Prevention Committee, Los Angeles, Calif., July 6, 1959.

The question then must go further, "If good human relations within the organization are indeed an effective means of accident prevention, who can do something about the quality of the human relationships within the working environment?"

Quality of Supervision

I believe that these human relationships are determined to a significant extent by the quality of supervision, although there are other factors, too. But here again we come to another question, "Who or what determines the quality of supervision?" And again, as in all matters concerning people, we have not a single answer, but many.

The quality of supervision in an organization is determined, among other things, by the quality and potential of the people in the working force which may be drawn upon for supervisory talent, by the adequacy of the selection procedures established to evaluate and choose from this potential, by the extent and the quality of supervisory training programs, and by the level of discipline, and morale within the supervisory group itself.

In a sense we are saying, then, that to the extent that accident prevention is a function of good human relations within the working force, it is determined by the quality of first level supervision, which to a significant degree is determined by the quality of management and leadership throughout the organization, up to and including the chief executive. Of course we already know this, but it is my opinion that sometimes we act as if we did not know it.

For instance, if our accident frequency rate or severity rate is high or on an increasing trend and we in management call in the safety director and tell him to do something about it, we may be talking to the wrong man. Maybe we should talk to ourselves. Maybe we should ask ourselves the question, "Is this unfortunate situation relative to accidents really an indication of inadequacy in the safety division staff or is it an indication of inadequacy in line management?" Now this is a real tough question to contemplate, let alone answer. So sometimes we manage to give the answer before we even frame the question.

If there is any validity in the theory that a correlation exists between human relations in an organization and the accident frequency rate, and if line management, as I sincerely believe, is responsible for the quality of human relationship within the organization, the conclusion that follows is obvious. We in management must, first of all, determine within our own minds what kind of human relationships are conducive to lowering of the accident frequency rate and to increasing the efficiency and productivity of the organization.

Production and Accident Frequency

We sometimes hear that an increase in productivity and a reduction in accidents are incompatible. Some people may even go so far as to say management must make a choice between these objectives and decide upon either one or the other.

Statistics are somewhat more helpful than words in attempting to convince any proponents of this "incompatibility theory." Accidents stand in fourth place as the most important cause of death in these United States after heart disease, cancer and cerebral hemorrhage. The 1957 figures of 95,000 deaths, 9,600,000 injured with 340,000 suffering some degree of permanent impairment and an estimated total cost of nearly $12 billion speak for themselves.

It is suggested that the minimizing of accidents and the maximizing of organizational productivity are a piece of the same cloth. Furthermore, any program that is directed primarily to either of these objectives to the exclusion of the other will very probably fail to attain either.

What kind of human relationships are conducive to lowering of the accident frequency rate and increasing the efficiency and productivity of the organization?

We have heard a great deal about human relations in business and industry, especially since the end of World War II. Probably more has been written and spoken on this subject than on any other pertaining to business and industrial management during this period. This tremendous effort toward a better understanding of people and their interpersonal relations within the group has increased our awareness of the problem of living and working together.

Obviously, much progress has been made towards a better understanding of this subject. It appears to me, however, that also a great deal of confusion and misunderstanding has come out of all of these millions of words about human relations. False concepts and improper and unattainable goals and objectives have emerged.

No End to Appeasement

Programs for developing better human relations in business and industry have been set up that, in the long run, will produce exactly the opposite results. Due to confusion and misunderstanding in some instances we have resorted to appeasement of pressure groups in the name of improving human relationships. The appeasement road usually leads only to more appeasement and attempts to reward irresponsibility. The abdication by management of its responsibility and obligation for effective leadership towards a common goal will never produce the objective of good human relations within the organization or within the community or, for that matter, within the national economy or in international affairs.

Neither can we buy good human relations through higher wages and salaries and fringe benefits. The basic feelings and attitudes of people towards each other and towards management are not for sale. A bribe or blackmail may temporarily change the overt behavior patterns of an individual or even a group, but it does not contribute to a real improvement in interpersonal relations.

Sometimes through our confusion and misunderstanding we interpret good human relations as a state in which all or most all people are happy, and then we strive diligently towards this unattainable goal of making people happy. Happiness is an individual and personal affair. It comes from within and cannot be injected from outside the individual like a hypodermic. Furthermore, every individual has his own unique brand of happiness and you are not about to let me decide what will make you happy or when you are happy.

In our search for better human relations we come

across the factors of fairness and justice, and then in our ignorance we over-simplify and set up a principle of treating all people the same and strive mightily towards this end. Eventually we find that, since all people are different, if we treat them all the same we are, in fact, treating them all differently. Of course we knew this at the outset, and if we had considered carefully we could have anticipated at least some of the pitfalls and the failures before they occurred.

In our quest for the Holy Grail of better relations we have also fallen back on another principle of long standing—the Golden Rule. We think that certainly this must be the way and then we are disappointed and disillusioned when it finally appears that our fellow man is so unreasonable that he will not accept or is not satisfied with the treatment that is acceptable and satisfactory to us. Here again we have overlooked something that we already knew.

Although people are similar in many ways and have a great deal in common, the personal values and standards and needs, the ambitions, the desires, the hopes, the guilts, the anxieties and the frustrations of each individual are different from those of all of his fellow men. In understanding people, recognition and appreciation of these differences are more important than the naming of similarities.

Blind Alleys, Dead-End Streets

These are some of the blind alleys and dead-end streets that we have walked. Where, then, is the highway to mutual understanding, to efficient productivity, to personal satisfaction, to safety and effective accident prevention, to growth and development, and to the realization of the potential of both the individual and the organization?

The traffic and direction signs pointing to this highway are few and poorly placed. There are many dangerous curves and traffic hazards and inviting by-passes and there are few signs to point the way.

Most of the sign posts along the road to our goal of cooperative, safe and effective productivity are faint and indistinct. One of the first we encounter, however, seems to say,"The answer is within ourselves." To understand our fellow men we must first begin to understand ourselves. Perhaps a beginning towards self-understanding is acceptance of the fact that what we see in another individual is partly him, partly ourselves, and partly something else. A full realization of the implications of this axiom is usually experienced as a considerable shock to the ego. If you have not yet felt the impact, perhaps you should think a little more about it.

Another sign post appears to carry the idea that not only is each individual different from all his fellow men, but he has been endowed with a God-given right to be different. Living and working together successfully obviously requires a considerable degree of flexibility and adjustment within each individual. In the minds of some people, however, conformity has become one of the greater virtues and individuality a downright evil. Perhaps the mutual respect within the high morale group arises in part through their sensing of individual differences and their acceptance of this rightness of being different.

Another sign post points to the innate need for growth and development in the individual. In this case the road sign carries a warning to beware of the resulting reaction from continued frustration of this individual need. Do we actually devote much of our time to thinking about anyone's growth and development but our own? Does our competitive society only provide for a certain fixed quantity of individual growth which inevitably must go to the most aggressive? Do we pay any attention to such danger signs along the road of interpersonal relations we seek to travel?

Early Indicators Are Confusing

These early sign posts are inadequate and confusing. These and similar sign posts about people indicate that we sorely need a map and a guide in the form of some expert advice from people who may have already traveled the route. But where can we find a reliable map and a qualified guide? Whom can we depend upon to show us the way? Perhaps we already have a clue to these answers in some of our past experience. What have we done to solve other complex problems of the business?

Research and development are important functions of the business enterprise these days. The industrial organization that does not budget time and money and manpower for such projects is considered to be backward and out of step with the times.

Yet the greatest asset of any organization is its people, and the proper development of this resource requires more time and more effort than the development of any other. How much of the research effort of your organization goes towards the study and development of this most important resource?

The application of science and engineering to material resources has given us technological progress beyond our wildest expectations. The fiction of Jules Verne's "20,000 Leagues Under the Sea" which thrilled us as boys is now accepted as commonplace reality. "Around the World in 80 Days" is as slow and out of date as the old Model T. We can now enjoy listening to a recorded human voice coming to us from a satellite in orbit.

Acceleration of Technological Progress

The acceleration of technological progress is amazing. J. Lewis Powell describes this acceleration in interesting terms. For the sake of graphic presentation, he compressed the 50,000 years of mankind's recorded history into 50 years, and on this basis developed the following chronology:

Ten years ago, man left his cave for some other kind of dwelling.

Five years ago, some genius invented the first writing.

Two years ago, Christianity appeared.

Fifteen months ago, Gutenberg developed the printing press.

Ten days ago, electricity was discovered.

Yesterday morning, the airplane was invented.

Last night, radio.

This morning, television.

The jet airplane was invented less than a minute ago.

Yes, science is making significant contributions to research and development at an increasing rate.

Yet many of us have not learned how to live with our

next-door neighbor, or get along with the boss, or to understand our fellow-workman.

The application of science to human relations problems has not yet begun. There is, however, a growing mass of scientific data available to us from the field of psychology and psychiatry. Yes, psychology and psychiatry!

These are controversial words and the concepts which they represent are misunderstood and misapplied or rejected out of hand. So were the theories of Hippocrates, and Copernicus and Darwin and Einstein and those who preceded and those who followed. Can we expect anything different for Freud?

Historically, many people resist or reject new theories and concepts, but a few are willing to listen and study, to explore and test, to correct and improve, and so progress due to scientific development does occur.

Science may have much to offer us in this business of solving human relations problems. Are you and your management using the science of psychology and psychiatry to assist you in developing a more reliable map of the human relations territory? Are you taking full advantage of the expert advice available from this field of science to assist in your accident prevention work?

How many times in your post-accident investigation work do you settle for the cause of the accident being formally recorded as due to carelessness, to stupidity, to a rule violation, to failure to concentrate on the job and the hazards involved, or to some other such "cause" which is neither a cause nor an explanation?

It may well be a fact that the accident followed the situation recorded as the "cause" as "B" follows "A" in the alphabet and the cause and effect relationship may be even closer. But are we really any nearer to accident prevention unless we know "A" actually caused "B" and what brought about "A"?

The science of psychoanalytic-psychology states that many accidents are not accidental. Perhaps you have come close to this theory in your accident proneness studies. Does the unconscious portion of the personality sometimes become self-destructive? What efforts have you made to examine this theory? Supposing it were found to have some validity, what would you do about it?

Another theory suggests that everything that we do today is more or less influenced by all of our experience that has gone before. The accident today may have been preceded by an argument at the breakfast table which may be an extension and repetition of a pattern of behavior from childhood.

An extension of this theory suggests that the attitude toward the boss may be an unconscious holdover from our relationship with the father-figure of long ago. Authority is symbolically equated from the father-figure in language. We commonly speak of "the old man," the "city fathers," the "father of his country," "God, the Father." Is authority also similarly equated psychologically? Does early sibling experience likewise affect interpersonal relations?

Is this unfinished business of childhood in its complexity and multiplicity of effects operating as an unseen and unrecognized factor in adult interpersonal relations and behavior? Where then lies the real "cause" of accidents? Why do we do what we do? How can we discover the answers to such questions?

Obviously, when we are seeking to understand human actions and reactions we do need the best scientific advice available. We need an open mind to listen and study, to explore and test, to correct and improve. We also need to be alert to the dangers of pseudo-science and the quackery and charlatans that still continue to hover on the fringes as did the witch doctors, the alchemists and the astrologers.

The challenge to improve our understanding of people is stimulating. The acceptance of the challenge is rewarding.

Four new promotion pieces to help farmers Farm Better Electrically have been prepared by EEI and are now available. They are: "Electricity Is the Key to Profit in the Life of This Chick," "Electricity Is the Key to Profit in the Life of This Lamb," "Electricity Is the Key to Profit in the Life of This Pig," and "Outdoor Lighting for Your Farmyard." Minimum order for any one of the four pieces is 1000 copies at $18 per thousand. Order from EEI Sales Dept., 750 Third Ave., N. Y., N. Y.

Reprinted courtesy *The New York Times*

NIXON AND KHRUSHCHEV ARGUE IN PUBLIC AS U.S. EXHIBIT OPENS; ACCUSE EACH OTHER OF THREATS

NO TEMPERS LOST

Both Express Hopes for Agreement in Geneva Talks

The Eisenhower message and the Nixon speech, Page 2

By HARRISON E. SALISBURY

Special to The New York Times

MOSCOW July 24—Vice President Richard M. Nixon and Premier Nikita S. Khrushchev debated in public today the merits of washing machines, capitalism, free exchange of ideas, summit meetings, rockets and ultimatums.

Mr. Nixon cut a symbolic red ribbon and formally opened the American National Exhibition. He said the fair was representative of the American way of life and called for "peaceful competition, spiritual as well as material, between the United States and the Soviet."

Premier Khrushchev [illegible] Mr. Nixon in reply [illegible] that the American exhibition would promote friendship between the two countries. In a message to the people of the United States, President Eisenhower expressed his best wishes for the success of the exhibition.

INSIDE STORY: Vice President Richard M. Nixon describes operation of an automatic washing machine at the U. S. fair in Moscow to Premier Nikita S. Khrushchev of the Soviet Union. Mr. Nixon acted as host during tour of the fair.

The Two Worlds: a Day-Long Debate

Nixon: 'I Am for Peace'

Premier: 'Eliminate Bases'

Electric Living in the USSR and in America

Nixon-Khrushchev Kitchen Debate in Medallion Home Spotlights 'Battle of Electrical Appliances'

THE all-electric kitchen of the Medallion Home displayed in the American National Exhibition in Moscow's Sokolniki Park has received world-wide attention because of the informal Nixon-Khrushchev debate held there.

Pictures of the two statesmen with an electric washer-dryer prominently shown were published in newspapers and consumer and trade magazines all over the world. Their conversation on electrical appliances sparked political cartoonists in many countries to feature washing machines in their cartoons.

Consumer and trade publications also used widely pictures of Edwin Vennard, EEI Vice President and Managing Director, awarding the Live Better Electrically Medallion to the home—known as "Splitnik." The Medallion signifies excellence in electrical wiring, electrical appliances and lighting.

The all-electric kitchen of the Medallion Home was furnished by General Electric Co. It features a built-in

The Nixon-Khrushchev debate in the kitchen of the model home displayed in the American National Exhibition in Moscow gave world-wide publicity to the home's all-electric kitchen.

A Moscow housewife, above, smiles with delight as she gets a chance to operate an American electric oven at the Moscow fair. Note smiling onlookers.

A Live Better Electrically Medallion awarded to the American model home on display at the Moscow exhibition is presented to Mrs. Osgood Caruthers, wife of *The New York Times* Moscow correspondent, by Edwin Vennard, Vice President and Managing Director of EEI, during his visit to USSR.

oven, a counter-top cooking unit, combination washer-dryer, refrigerator-freezer, and a water heater.

All these appliances which are within the reach of the average American homemaker are only visionary to the Soviet housewife. The average U. S. residential use of electricity in 1958 was 3366 kwhr. This compares to an estimated 600 to 900 kwhr for the Russian residential customer. For lighting and small, miscellaneous appliances, the U. S. family consumes approximately 750 kwhr a year. Although not a great deal is known about exactly what is available to the USSR housewife in the electrical appliance field, the kwhr consumption in itself would rule out much more than ordinary lighting and a few minor appliances.

UPI's Report

A comparison of electric living in the Soviet Union and America was drawn by Claire Cox in a United Press International article which appeared in newspapers on Sunday, Aug. 9, 1959. Excerpts from the article follow:

Besides creating a lot of political speculation, the Khrushchev-Nixon kitchen debate in the electric Medallion Splitnik now on exhibit in Moscow has also aroused curiosity about the kind of electric appliances the Soviet Union is manufacturing for its own use and whether they compare favorably with our own. For instance, if Russia and the United States should begin trading, what kind of electric appliances would the Soviet Union be able to send us today?

In regards to electric living, every American is familiar with the appliances we have. In choosing appliances our biggest problem is deciding which brand suits us best. Competition has kept electric manufacturers improving the quality and the performance of their products. Americans are also aware that using a quantity of electric appliances necessitates a home wiring system to accommodate them—in other words, having a home with full housepower so that it can successfully operate electrically.

Elusive Soviet Appliances

Finding out the kind and the quality of electric appliances in the Soviet Union is not a simple task.

Ours can be tracked down in the pages of almost any publication. The Soviet Union's electric living cannot be so easily deduced. Mr. Khrushchev's defensive remark after looking over our appliance-stocked kitchen, "all our new houses have this kind of equipment," gives no actual concrete example for comparison.

From Soviet architects in the New York Coliseum we learned that the modern Soviet home being built today has 110 voltage. This would immediately rule out the possibility of using such heavy duty appliances as an electric range, dishwasher, combination washer-dryer, combination refrigerator-freezer, water heater and numerous smaller appliances in quantity. The modern Soviet apartment exhibited in the New York Coliseum bears this out. Only the refrigerator, mixer, percolator and samovar on display were electric.

In Russian stores there are electric appliances for sale. According to visitors they are usually of poor quality and excessively expensive. In the New York Coliseum the quality of the few electric appliances certainly did not compare favorable with our own American brands.

Architecture has a considerable influence on electric living. Only an updated or newly built house can accommodate major electric appliances. Building in Russia is state controlled and therefore the occupant has very little to say about the amount of electric power in his home. The Soviet Union concentrates solely on precast cement or brick multiple housing to meet the great need for public dwellings. Plumbing and wiring are prefabricated, with outlets and wiring built into the walls before they are set up. Home lighting meets the barest minimum requirements. The circuit breaker is unheard of. Soviet electric officials were astonished when they learned from Edwin Vennard, Managing Director of the Edison Electric Institute, how much electricity was consumed by homeowners in the United States.

Except for the Coliseum Exhibition, Soviet electric appliances have not been shipped to the United States. The Soviet official agency, Amtorg Trading Corp., 355 Lexington Ave., New York, has listings of books and records that can be ordered but no electric appliances. The research department at *Consumer Reports*, which compares best buys and sometimes gives an American brand a whacking, said it had never had the opportunity to test any of the USSR appliances . . . but would like to.

Conclusions Drawn

From the information available, we are left to draw the following conclusions about electric appliances and electric living in the USSR:

- First, electric appliances do exist in the USSR but they are not as advanced as our own, or as reasonable.
- Second, modern Soviet construction does not have the electric power or wiring to accommodate major electric appliances.
- Third, the design and quality of Soviet appliances are poor and it is difficult even to determine the date of their manufacture.

If electric living in the Soviet Union is so limited, it can easily be understood why the General Electric kitchen in the American Medallion Splitnik is so unbelievable to Mr. Khrushchev and so fascinating to Russian women. If inferior Soviet appliances are so costly and difficult to run it is also understandable why the Russians find it hard to believe that anything as fantastic as an automatic electric kitchen is within the reach of the average American homeowner.

The Americans knew about the Russian Sputnik the day it happened but 12 years after the automatic kitchen came into the American home the people of Russia find it hard to conceive that the electric living in the Medallion Splitnik is more than a myth.

As our American representatives have pointed out, the life of the Russian people could be made a lot easier with our electric conveniences, but of course this would involve free trade and competition with the products of other nations.

The kitchen summit may prove to have had a more advantageous setting then many more high level talks. There is the American adage about building a better mouse trap. If you know about a Sputnik you can try to make a better one; if you don't know or can't believe about the marvels of electric living, you may, as Confucious might say, "continue to burn your toast."

A Research Project on Automatic Electronic Accounting Machinery

Completed by the Computation Laboratory, Harvard University
Dr. Howard Aiken, Director

Final Comments by the Electronic Steering Committees of the Edison Electric Institute and the American Gas Association

"To develop and evaluate . . . the design theory of electric accounting machines, with particular reference to the application of automatic electronic machinery to the needs of . . . the electric and gas industries specifically."

THE foregoing excerpt from the research contract signed in May, 1955, with Harvard University by the Edison Electric Institute and the American Gas Association highlights the intent of the first research project undertaken by the Accounting Divisions of the Associations and the first project of its kind undertaken by the Computation Laboratory under the direction of Dr. Howard Aiken.

At its completion, the project must be viewed in terms of the status and use of "automatic electronic machinery" at three points in time: 1955 when the project was begun, 1959 when it it concluded, and five or 10 years in the future.

When the research work began, the first generation of large-scale business computers, recently developed from scientific computers, was announced, but not in use in our industry. There was a general question as to whether the arithmetic powers and memory of the "first generation computers" were not excessive and whether peripheral input and output equipment was adequate for our industry, particularly in reference to the customer accounting problem. This motivated the research project.

Problem More Complex

As the project progressed, beginning with a visit of Dr. Howard Aiken and several members of the staff to several utilities during June and July, 1955, and culminating in a statement of the Customer Accounting Process in Report No. 7,* it became apparent that the customer accounting problem was far more complex than originally conceived. The many variations and exceptions relative to customer accounting, including those imposed by customers, do not lend themselves to simplification of computer design and do require improvements in existing input-output facilities. During the same period, actual industry use of this type of equipment on the customer accounting problem reflected severe limitations in memory and programming facilities. Present equipment installations employ much larger computer memories than originally contemplated and are still faced with programming problems, while input-output equipment is still in a state of rapid development. Consequently, contrary to the original concept, research and actual experience indicated certain inadequacies of existing large-scale equipment.

Slow Development

In the meantime, slow development of random access equipment involving the storage of large volumes of records directly in memory, constantly available to a computer and human reference, was observed. High density drums, magnetic tape "bins," and magnetic discs were subsequently developed and used to store larger records.

These developments were carefully studied by the Harvard Group and related to the widespread industry practice of decentralization of accounts receivable records and processes into "station" and "unit" bookkeeping plans. These studies led to an inquiry into the possibilities and potentialities of a random access solution to the customer accounting problem, using a "station" type machine for 50,000 accounts. This size machine was considered optimum for marketing broadly in the industry.

This line of inquiry resulted in visualization of two types of equipment, one based on "tape bin" equipment, involving strips of magnetic tape, which is commercially available, and the other on a small magnetic card capable of rapid processing, which is under development and not priced. Estimates of the equipment and operating costs are not conclusive but, as might be expected, indicate that further improvements, beyond the present state of technology, are required to offer attractive economic opportunities, particularly since the latest "generation" of serial commercial computers considered as competitors to a random access approach, show a dis-

* Progress Report No. 7 is the final report in the Harvard Research Project which recently was concluded. There is a limited number of copies of this report available to member companies upon request to: Accounting Division, Edison Electric Institute, 750 Third Ave., New York 17, N. Y.

tinct improvement in the price-per processing level.

This economic projection is consistent with the relatively slow growth in the use of random access devices applied to relatively larger record-keeping problems as the cost of such memory decreases. The customer accounting study clearly reveals that the very large, but relatively low activity, records in our customer accounting problem present a considerable economic barrier.

Projection of Trends

To view the research project from some time in the future requires projection of existing trends. These certainly include constantly increasing labor costs, a recent cost improvement in computer equipment, particularly in the incremental cost of larger computer memory, as well as considerable laboratory study of entirely new devices for memory storage.

It is conceivable, with a breakthrough in memory cost, that all of a utility's records may someday be stored in electronic or magnetic memory to which a group of personnel will feed information and possibly other or the same personnel will automatically select information.

The random access storage conception of the research project may very well become a step in this direction and may actually be approached earlier in smaller and decentralized companies where a high level of mechanization is not available with relatively large scale serial processing equipment. The potential of the magnetic card, being new and untested in experience and economics, might very well be the entry to this conception.

In addition to the development of the proposed electronic systems, there are some important "by-products" of the research project as follows:

- A very intensive study of the variety, volume and timing of customer inquiries.
- The development of a concept, called "parenthesis-free" notation, which suggests that appropriate instructions could be included with the data to be processed. A computer then could be designed with a very limited number of memory registers, perhaps of simplified design. It was agreed that such an approach would be limited to problems of a lesser scale than encountered in our industry.
- While the many problems encountered in the research project limited the investigations to customers accounting, this does not imply that the potential application of the proposed systems should be limited. The flexibility and capacity of the equipment conceived suggest that it may actually be of earlier interest for application to general accounting where relatively smaller, but more active, records are involved.

The research project, which dealt with significant questions during the recent rapid development in electronic computing equipment, resulted in the following accomplishments:

- Provides an excellent definition of the customer accounting problem. This includes a detailed description, in language and chart form, of the revenue accounting process and the characteristics of the data processed. These data will be especially helpful to companies starting electronic studies in applications as well as equipment design. The statement of the problem was welcomed by all computer manufacturers, particularly at least six manufacturers new to the computer field.
- Emphasizes the complexity of the customer accounting problem which is not yet appreciated by people who have not investigated the application of electronic data processing systems.
- Indicates that because of problem complexity and the current status of technology, simplified computer design is not reasonably possible at the present time. Industry experience also indicated that capacities, circuitry and input-output equipment of early computers were actually inadequate.
- Suggests that the development of a "special-purpose" random access electronic system for utility accounting purposes, and specifically for customer accounting, may be some years away. The two conceptions of electronic random access storage machines for 50,000 customers, developed and tentatively priced after careful study of known technology, point towards the future in both economic and technological availability.
- Provides a guide to the future study and development of a random access approach in the design of computing systems for utility accounting operations.
- Indicates that it may be possible to consider the design and development of automatic equipment for small utilities which in the past have not been able to justify economically the mechanization of their accounting functions.
- Suggests at least two developments which should immediately be followed up and encouraged for use in utility accounting operations. One is character sensing equipment, and the other is magnetic card storage devices. At least four manufacturers are known to be working on public utility design conceptions of character sensing equipment, and both proposed random access storage devices have beeen further developed by manufacturers in the past year since Progress Report No. 7 was issued. These developments indicate strong possibilities in overcoming the technological and economic limitations of the research concept. To further implement these developments, the EEI-AGA Electronic Accounting Machine Developments Committees are already organizing to encourage design by manufacturers in the two fields of character sensing and random access storage.

Project Influences Equipment Design

It is evident that the research project has already influenced, and will continue to influence, design of electronic equipment for our industry. This is emphasized by a statement appearing in *Fortune* magazine as follows:

> ". . . The real computer boom will come sometime later in the 1960's . . . when machines with a true 'random access memory' are developed. The great limitation on the current generation of computers is the fact that they can be used only in a rigidly prestructured way."*

The Steering Committees are extremely appreciative to the industry, Dr. Howard Aiken and his staff for the stimulating experience of our participation which con-

* Silverman, Charles E., and Parker, Sanford S., "How the U. S. Can Get 50 Per Cent Richer," *Fortune*, March, 1959, p. 212.

sisted of facilitating the study of our industry's problem. It conveys that appreciation of the industry to Dr. Aiken and his staff for informed comment and counsel in numerous discussions and addresses at our conferences and seminars, which so much clarified the rapidly growing field of electronic data processing for our industry.

The members of the EEI-AGA Harvard Electronic Research Steering Committees are as follows:

EEI	*AGA*
W. J. Ott, Chairman	E. T. White, Chairman
E. L. Cassady	R. H. Johnson
J. D. Elliott	R. F. McGlone
F. J. Porter, Jr.	A. Skelton

Summary of the Computation Laboratory of Harvard University

Introduction

This final report summarizes the research in automatic data processing performed at Harvard University under the joint sponsorship of the Edison Electric Institute and the American Gas Association, with the cooperation of the Electronic Research Steering Committees of the sponsoring organizations, and under the direction of Prof. Howard Aiken.

The work began in June, 1955, and resulted in the publication of 26 individual reports by the seven staff members engaged in the work for varying periods of time. Early reports dealt with rather general topics such as flow charting notations for both manual and tabulating machine accounting systems, the programming of logical decisions, the use of parenthesis-free notation, the evaluation of piecewise linear functions arising in bill calculations, compression of tables in automatic computers, and the characteristics of random-access storage devices.

The work then narrowed to a more intensive study of salient problems in revenue accounting, notably the production of statistical information, the random access storage requirements imposed by customer inquiries, account numbering, and the over-all organization of a system for revenue accounting. These investigations culminated in a unified and detailed proposal for the organization and mechanization of a customer accounting system presented in Report No. 7.

Customer accounting was selected as the largest volume and most costly single area. Although intensive study was limited to this one area, it is probable that the system could find wider application in other accounting areas. Because of its relative importance, and because the Steering Committees solicited and received critical comment upon it from member companies and computer manufacturing companies, Report No. 7 is described in some detail.

Summary of Report No. 7

The customer accounting system described in Report No. 7 is based upon two major premises: that all required customer information is recorded in a single file, and that efficient manual intervention is possible in dealing with some of the exceptional cases.

TABLE I—REQUIRED EQUIPMENT

Required Equipment	Principal Use
Central Processor	To handle logical and arithmetic operations
Storage Equipment	To store customer data and computer programs
Input Reading Station	To read in cash stubs and meter readings and miscellaneous inputs
Inquiry Station	To request information from the customer file
Output Display Station	To display file information previously requested
Output Printing Station	To print bills, cash listings and reports
Miscellaneous Output Station	To produce meter reading medium, cash exceptions and miscellaneous outputs.

Obviously it is easier to maintain a single file than to cope with a multiplicity of files. However, if that file is to be used to answer inquiries, as well as for billing and other purposes, a file of the random access type is required. With a file of this type it is much easier to keep the customer records updated, since postings and account changes can now be handled in random order. Out-of-cycle and other exceptional items can be processed without requiring any batching and sorting, and programming costs are reduced because such items can be rejected and handled by special means.

Based on a study of the public utility market in the United States, it was decided to design a data processing system capable of handling approximately 50,000 accounts. For this volume of business a relatively low-speed system was adequate, with an average random access time of about 20 seconds. The required equipment configuration is shown in Table 1.

Two alternative systems were proposed: the first one is based on the use of short, parallel strips of magnetic tape for the storage of the customer file and for certain programs, while the other is based on the use of mag-

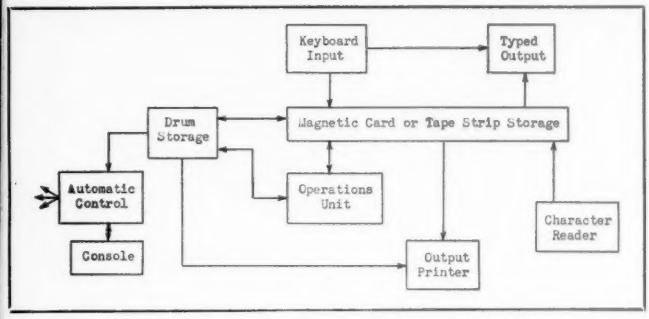


Figure 1

netic cards for the same purpose. In both systems, the customer file is shared between the routine processing and the answering of random requests. A magnetic drum is used as a buffer and as working storage, and the inquiry and display stations consist of a keyboard input with associated typewriter display.

Since punched cards are used for billing in the tape strip system, while paper bills are used with the magnetic cards, a punched card reader is used as input station in the first system and a special character reader which recognizes printed characters is used in the other system. In both cases a tabulator-type printer is used for output printing. A somewhat simplified diagram of the proposed system is shown in Figure 1.

The problems raised by the two suggested systems differ in some respects. The tape strip system, for example, presents difficulties in connection with the organization of the customer records; these difficulties are not present in the magnetic card system. Indeed, if a separate magnetic card is provided for each customer record, changes in the records are made by simply adding or deleting cards as required. In order to make changes on the tape strips, or to reshuffle information in any way without reorganizing the complete tape file, a great deal of ingenuity is required. This is especially true because the amount of recorded information varies from customer to customer. On tape, it is thus necessary to provide for blank pieces of tape so that new accounts can be accommodated without disturbing the information previously recorded. Sorting operations are also much simpler if magnetic cards are used. On the other hand, the tape strip system is commercially available and is relatively inexpensive, while the magnetic card system is not available as yet and is likely to be more expensive.

In spite of these obvious differences, it is possible to evaluate the concepts used in the design of the systems without regard to the particular type of file organization chosen.

Evaluation of the Proposed System

In attempting to evaluate the proposed system, the Steering Committees distributed the report to member companies of Edison Electric Institute, American Gas Association, and manufacturers of data processing equipment with a request for general and detailed comments. The present section is a commentary based on these replies, and upon comments made by the Steering Committees.

The questions raised fall into five broad classes. The first concerns the accuracy of the timing estimates made for the various processing tasks and the over-all problem of deciding whether the customer accounting tasks actually could be handled as described. The second concerns the advisability of using a compact, self-contained unit for revenue accounting only, rather than a general purpose computer which would handle all accounting tasks. The next two classes concern, respectively, the use of random access equipment, and the advisability of allowing manual processing. Finally, the last set of questions is concerned with the economic justification of the proposed revenue accounting system.

A. Timing Estimates.

To estimate how much computing time is required by a given data processing task, the following information is normally needed:

(1) The nature of the processing task.
(2) The nature and quantity of inputs and outputs.
(3) The characteristics of the data processing equipment.
(4) The nature and length of the required computer programs.

When estimating the processing time for a known task on a specified, existing computer, the first three items are usually available; the last item concerning the number of required instructions causes most of the difficulties. When the estimate must be made before actually writing many of the computer programs, it cannot be expected to be precise.

In the case of the proposed revenue accounting system the situation was complicated by the fact that the study was not made for a specific machine with known characteristics nor for a specific utility company. Because a composite model was chosen by considering the procedures and volume figures of many utility companies, it would be idle to pretend that the timing figures given are necessarily very precise.

However, the equipment actually chosen is generally faster than required by the timing estimates. For example, assuming an average of one incoming random request per minute throughout a nine-hour day, an interruption of routine processing of 20 seconds per random request was found tolerable; actual average interruption time is only about 17 seconds for the tape strip system and only nine seconds for the magnet card system.

More accurate and trustworthy results can be obtained only by actually trying out some of the programs on a computer of the type required. This can be done either by actually building the proposed system, or by simulating the proposed systems on an existing computer. In either case, a large amount of programming is necessary.

B. The Accounting Station Concept.

The next area of interest concerns the proposed use of a separate, self-contained unit for the customer accounting processes. It is clear that public utility companies must perform many diverse accounting functions, among them payroll accounting, accounts payable, stock control, materials and supplies, and customer

accounting. The latter accounts for a substantial part of the accounting cost, but represents only one of a number of different accounting tasks. It is therefore pertinent to question the advisability of treating customer accounting separately from the other tasks.

While the proposed system is based exclusively upon the consideration of customer accounting, since this area represents the largest piece of accounting work, it is nevertheless believed that the system design might well be adaptable to a large part of the general accounting work as well. Moreover, it should be remembered that even in completely mechanized systems, customer accounting always represents a specialized job for which a certain amount of specialized training is necessary. It may be argued that these specialists would lose much of their effectiveness if they were also to handle general accounting work. Moreover, the customer accounting work may be much simplified, if the same bookkeepers were always to handle the same set of customer accounts, because familiarity with certain difficult accounts would then dictate the course of action in a particular situation, and many elaborate procedures for special cases would not need to be included in the computer programs. This is recognized by many utility companies which operate with the so-called "unit plan" for revenue accounting. Such "units" have precisely the same function as the proposed self-contained accounting station, except that most of the work is done manually in the units, instead of automatically. Advocates of the unit plan also claim that such units have important beneficial customer and public relations aspects which make the plan attractive. The proposed mechanized unit would be advantageous for the same reasons.

Some Objections Raised

Some people, while recognizing in principle, the desirability of a self-contained accounting unit, nevertheless object to this approach in a mechanized system on the grounds that this violates the "building block" concept. This is of some importance to public utility companies, because of the customer growth which affects many areas. Thus, many companies would like to start with small, relatively inexpensive systems, while still being assured that additional customers could be accommodated at a later time by increasing storage capacity and adding input-output equipment.

Unfortunately the building block concept, while attractive in theory, has certain defects. In fact, the amount of equipment which can be added without extensive changes in computer hardware is normally very small. Moreover, additional equipment usually implies extensive reprogramming, thus increasing the cost of the change above and beyond the cost of the added equipment. The addition of a second accounting unit, then, may not be costlier than extensive changes in the original machine hardware and in the computer programs. Less drastic changes, such as multi-shift operations or added inquiry facilities, are also possible in the proposed accounting unit.

C. The Use of Random Access Equipment.

Two main factors militate against the use of random access equipment for business data processing. The first one concerns the cost of the equipment: in many cases, random access equipment with large enough storage capacity and fast enough access times is not economical. This argument is not applicable in the present instance. Indeed, a variety of equipment exists with a storage capacity between 10 and 20 million characters of information and an average random access time of the order of a few seconds. There is no merit in providing faster equipment for the customer accounting application, since the excess speed would serve only to increase the cost of the equipment, without providing any needed improvements in the system characteristics.

The second and more serious argument against the use of random access equipment deals with the operational problems. Indeed, it can be claimed that an organization which makes both the inquiry and the processing functions entirely dependent upon the same equipment cannot properly provide for peak loads and for schedule impairments. In particular, a machine breakdown would now affect *all* functions, including the customer contact functions, and might seriously impair not only the accounting schedule, but also the customer relations.

While there is no intent to minimize the cogency of this argument, it is nevertheless believed that the operational problems raised are not substantially more serious under the random access organization, than they are for any other mechanized system. Indeed, certain priorities in the processing can be set up by automatic means to restrict the computer to certain important functions, while excluding certain others during peak periods. For example, routine processing could be completely dropped during peak inquiry periods. Furthermore, program interrupt features can be used to permit the computer to switch from one program to another as may be dictated at any time by the volume of business. Facilities for priority processing and program interruptions are now available in many computing systems.

The danger of machine breakdown is, of course, not alleviated by the priority processing. However, a periodic write-out of the customer files is necessarily required regardless of machine organization for purposes of file reconstruction. Printing of this record could be used to satisfy most of the customer requests. To this effect it is necessary to search manually through a large volume of printed information; this operation, admittedly clumsy and time-consuming is now used in many mechanized systems, and it can equally serve with the proposed random access equipment to overcome a temporary emergency.

In conclusion, it is believed that the suggested use of random access equipment does not present any insuperable operational problems, and that the benefits provided by the proposed organization are far from overcome by the additional, relatively minor inconveniences in case of breakdown. The danger of prolonged malfunction of the equipment appears to be no more than in differently organized data processing systems. In fact, standby equipment may be easier to provide for a relatively small, individual unit than for a single large general purpose machine.

D. The Extent of Manual Processing.

The cost of programming constitutes a heavy burden in the operations of a computer installation. Unfor-

tunately, in a system with restricted file access it is necessary to fit all accounts into the same mold; long programs are then required including every possible exception which may affect any of the accounts.

If, on the other hand, access is available at any time to all customer records, there is no longer any need to process the accounts in any established order. It is then possible to reject those accounts which do not fit into the general pattern, and to process them separately at some later time. For this reason, it was suggested that in the proposed system, programs need not be provided for some of the cases which occur very infrequently. Instead, such exceptions can be handled in part manually by a special bookkeeper who is familiar with the given accounts and who knows which procedures apply in each case.

Two Arguments for System

The arguments which are generally cited in favor of the fully automatic system are two-fold; first, that it is precisely the ability to handle automatically the relatively costly exceptions which has helped to justify the installation of automatic data processing equipment in many organizations; secondly, that a saving in programming costs resulting from the manual intervention in the processing of irregular accounts would be false economy, since it would eliminate the *one-time* cost of programming, while keeping the large continuing cost of handling certain exceptions manually.

It would seem that the argument could be sustained if it were indeed a fact that the cost of handling the exceptional cases is lower in an automatic system than in a semi-manual system. In many business processes the reverse appears to be true. The reason is that the mechanization of the rarely occurring exceptions will adversely affect the processing of *all* "regular" accounts. Specifically, the programs covering the regular account must be needlessly complicated to cover also the exceptions, thus lengthening the processing time for all accounts. Furthermore, written procedures must then be available covering all cases which may or may not arise in practice. This imposes a further burden and increases the cost of converting to many automatic systems. Finally, it is clearly fallacious to claim that a one-time programming cost is being replaced by a continuing manual processing cost under the proposed semi-automatic system, since programming represents a continuing cost throughout the years; moreover, this cost is by no means negligible. This is just as true in a business organization where procedures and requirements change, as it is in a scientific computing installation where the problems vary.

Some objection might be raised at having decisions affecting a rejected account made on the spot by the machine operator, since such a procedure is likely to cause unnecessary errors. There is, in fact, no particular need why a decision should have to be made immediately after rejection. A special bookkeeper can easily handle the manual work away from the machine at some convenient time.

In conclusion, it is believed that the rejection and subsequent manual processing of exceptional items, made possible under the proposed organization, will not only reduce the programming task but may actually speed up the accounting functions. Of course, some discretion must be used in deciding which conditions occur with sufficient frequency to warrant automatic processing. If 30 or 40 percent of the accounts were to be earmarked for manual processing, the system obviously would not function properly. However, the rejection of 2 or 3 percent of the accounts may result in considerably improved operations.

E. The Economic Justification.

A brief analysis was made to determine the approximate cost of the proposed customer accounting unit. The data indicated that the combined yearly cost of salaries and equipment would be about 20 percent higher under the proposed system organization than in a system using only ordinary tabulating equipment. However, while in the present system 90 percent of the cost is used for salaries and only 10 percent for equipment, 45 percent of the cost of the proposed system is used for equipment and only 55 percent for salaries. Since salary costs tend to rise much faster than equipment costs, it is likely that the cost comparison will look much more favorable a few years from now than it does at the present time.

While the economic comparison thus is not discouraging, even from the immediate point of view, an attempt can still be made to determine those factors which contribute most heavily to the comparatively higher cost of the proposed system. It then may be possible to provide a more accurate economic analysis than that furnished by the crude equipment and salary data previously cited.

To start with, it is clear that the cost comparison previously mentioned does not include a number of significant factors which may tend to alter the cost picture. For instance, installation and change-over costs are not included; neither are a great many intangible benefits such as faster service, more accurate operations, earlier receipt of payments, improvement in procedures, and so on. It may well prove, for example, that if overhead costs on salaries had been taken into account, the cost of the proposed system would not have been much higher than the cost of present systems, since salary costs and, therefore, salary overheads are much lower in the proposed system. Thus, many intangible benefits which were not included in the first analysis should be included in a more refined analysis.

Three Cost Factors

Assuming now the suggested equipment and system organization, there are three factors chiefly responsible for the cost of the system. The first is the equipment cost itself, the second is the amount of use of the equipment, and the third is the size of the proposed unit. As to equipment cost, it could be claimed that there exists no low-cost, random access storage equipment, and that an organization which permits file interrogation and uses such equipment will always be more costly and less efficient than a system built around serial access equipment. This argument may have some merit if very fast access times are needed, or alternatively, if the required storage capacity is very large. In the present system access times of the order of 10 or 15 seconds are satisfactory and the required storage capacity is well within the range of available equipment. The random access equipment, in itself, is not considerably more expensive

than more conventional data processing devices. For these reasons, it is believed that the cost of the equipment can be properly justified in the proposed accounting system.

The second argument concerning the equipment utilization is believed to be more critical. Indeed, in the proposed mode of operation, a large part of the available equipment will remain idle during much of the processing time. Thus, during routine processing the file interrogatior. equipment is not utilized, while the routine processing equipment is not used during file interrogations. This situation results in poor load factoring and causes greatly increased processing costs.

Two possible solutions would seem to merit investigation. The first one consists of allowing two or more independent searches of the customer files to proceed simultaneously. If, for example, it were possible to handle two independent searches of the files simultaneously, then routine processing could proceed, while at the same time a customer request could be handled, or alternatively two different inquiries could be answered simultaneously. Data synchronizing equipment which allows simultaneous file interrogations is now provided with a number of computing systems. If such synchronizing equipment were added to the basic equipment it would clearly be possible to handle a greatly increased volume of business.

The Second Solution

The second solution to the load factoring problem consists of using more than one unit, while at the same time sharing equipment between units. Thus, while an inquiry search is being handled for unit one, the routine processing equipment which would normally remain idle would be used by the second unit for billing, or other purposes. Such a procedure would require a more complicated system organization, but it would again result in a better utilization of the equipment and in providing facilities for greatly increased work loads.

This introduces the third cost factor—the size of the proposed accounting unit. The equipment was designed for a maximum load of 50,000 customers in accordance with a survey of utility companies in the United States. The survey indicated that this customer range would furnish the greatest possible demand for the accounting unit, since many more companies were interested in units of this relatively small size than in larger units. Unfortunately, since the cost can be spread over only 50,000 customers, the somewhat unfavorable cost picture previously mentioned cannot be avoided. Moreover, because of the poor equipment utilization it is unlikely that the cost factor would be much improved by providing multiple units for large companies. Thus, a company with 300,000 customers could probably not save money by using six units. However, it may well be possible for such a company to use four units sharing equipment.

In conclusion, it would seem that a more refined cost analysis might well be worthwhile. Moreover, it would seem that both the sharing of equipment between units and the processing with multiple search units would result in much better load factors, thus making available the same basic equipment for a larger number of customers, and reducing the processing cost per account. Both possibilities deserve careful investigation.

Conclusion

It is believed that the proposed customer accounting system is adaptable to the revenue accounting procedures of most companies. These procedures are too complex for the optimum application of computing equipment based upon serial access files, and the industry should encourage the development of equipment for implementing the proposed system. Moreover, the statement of the revenue accounting task (Chapter 1 of Report No. 7) upon which the entire design was predicated should prove useful in the design of any further systems.

Applied Citizenship

(*Continued from page* 300)

educational programs, the company hopes that many more Edison employees will broaden their role as good citizens and become more active, in the party of their choice, in the public affairs of their communities, their state and their nation."*

Many people mistakenly feel that politics is a dirty word. They hesitate to associate themselves with something of which they do not approve. The best way to improve a situation, however, is for each and every one to get out and do something about it. In the words of Elihu Root:

"Politics is the practical exercise of self-government; and somebody must attend to it if we are to have self-government."

* The policy also covers situations where employees might hold public office. It encourages employees to accept such responsibilities and outlines the procedure to avoid a conflict of interest.

Information Service Started

A NEW monthly information service for the employees of electric companies will be available starting in September, according to an announcement by Edward R. Dunning, former vice president of N. W. Ayer & Son, Inc., and long associated with the Electric Companies Advertising Program.

Principal feature of the service will be a syndicated column, to be called "Ed Dunning Says," dealing with issues that concern electric company people, particularly in the fields of government in business, taxation, and their effect on personal freedom. Designed primarily for publication in electric company magazines, the monthly column can also be used on bulletin boards.

The new information service is designed to help make electric company employees aware of their stake in the free enterprise system and what government in business costs them in taxes and personal freedom.

A further aim is to encourage employees to become outspoken opinion leaders in their communities, thus increasing the number of those actively opposed to the spread of government and wasteful government spending.

Consolidated Edison Section Attains 5 Million Accident-Free Manhours of Operation; Baltimore G&E's Meter, Installation Section Passes the 4 Million Manhour Mark; Four Companies Get 3 Million Manhour Awards

82 Safety Awards Presented

A TOTAL of 82 Safety Achievement Awards were presented by EEI to member companies from Dec. 15, 1958, to July 15, 1959, for achieving 1,000,000 or more accident-free manhours of operation.

The Station Construction and Shops—Holder Maintenance and Painting Bureau of Consolidated Edison Co. of New York, Inc., attained 5,000,000 manhours of work without an accident. This group, which performs 90 percent of its operations in generating stations and elsewhere on the system, has a no-accident record extending back to January, 1949.

An award for 4,005,451 safe manhours of operation went to the Meter and Installation Department of Baltimore Gas and Electric Co., and four companies received awards for operating 3,000,000 manhours or more without an accident. They were: The Union Light Heat and Power Co., a subsidiary of The Cincinnati Gas & Electric Co.; The Cleveland Electric Illuminating Co.'s Electrical Operations Department; Commercial Buildings—Operations Bureau of Consolidated Edison Co. of New York, Inc.; and Gulf States Utilities Co., entire company.

Seldom does a company with less than 100 employees on its payroll achieve 500,000 accident-free manhours of operation, entitling it to a Safety Achievement Award. The Old Dominion Power Co., with an average of 73 employees, worked from Nov. 3, 1955, to Feb. 28, 1959, without an injury to receive its award last March.

Following is the complete list of awards:

Alabama Power Co.
- Southern Division 1,002,005
- Richmond District 1,059,675
- Electric Operations 1,923,708
- Barry Steam Plant 1,000,305
- Production Department 1,004,233

Appalachian Power Co.
- Charleston District 1,000,000

Baltimore Gas and Electric Co.
- Power Production Stations 1,003,791
- Operating Stores Department 1,079,331
- Electric Operating Departments 1,105,219
- Meter & Installation Department 4,005,451
- Electric Distribution Department 1,048,719
- Electric Operating Departments 2,115,097

Central Illinois Public Service Co.
- Western Division 1,000,088
- Jerseyville Group 1,000,212

Central Maine Power Co.
- Central Division 2,000,657

Central Power and Light Co.
- Entire Company 2,413,570

The Cincinnati Gas & Electric Co.
- Electric Production Department 2,000,000
- Electric Production Department—Miami Fort Station 1,000,000
- The Union Light Heat & Power Co.—Entire Company 3,392,127

The Cleveland Electric Illuminating Co.
- Electrical Operations Department 3,000,000

Consolidated Edison Co. of N. Y., Inc.
- Staten Island Operations 1,000,000
- Westchester Operations 1,000,000
- Station Construction & Shops—Holder Maintenance & Painting Bureau 5,000,000
- Station Construction & Shops—Mechanical Construction Bureau 2,000,000
- Outside Plant Construction Department—Underground Bureau 2,000,000
- Station Construction & Shops—Shops Bureau 1,000,000
- Production Department—Glenwood Station .. 1,000,000
- Commercial Buildings—Operations Bureau .. 3,000,000
- Staten Island Operations—Production Department 1,000,000

Consumers Power Co.
- Wealthy Street Steam Plant—Western Region 2,000,088

The Detroit Edison Co.
- Construction & Maintenance Department 1,008,049
- Trenton Channel Power Plant 1,001,930
- River Rouge Power Plant 1,000,000
- Buildings & Properties Department 1,002,295

Duke Power Co.
- Entire Company 1,246,842

Duquesne Light Co.
- Substations & Shops Department—Meter Section 2,000,027
- Power Stations Department—Colfax Power Station 2,000,728

Florida Power Corp.
- Entire Company 1,094,064

Georgia Power Co.
- Columbus Division 1,657,819

Gulf States Utilities Co.
- Baton Rouge Division 1,500,000
- Entire Company 3,000,000

Indianapolis Power & Light Co.
- Power Production Department 1,121,714

Interstate Power Co.
- Winnebago District 1,003,116

(*Continued on Page* 322)

Remarks of Mr. Bailey Before the EEI Prime Movers Committee Meeting at Chicago, Ill., May 4, 1959

History of the Prime Movers Committee

By Alex D. Bailey
*Past Chairman**

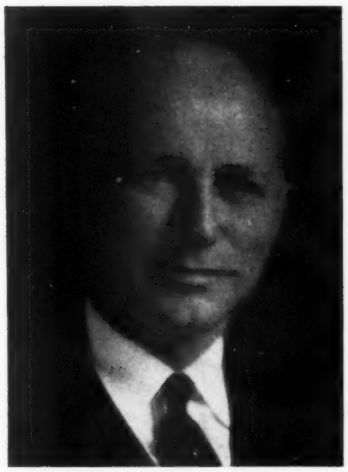
At the 1903 convention of the National Electric Light Association, a committee of "three good mechanical engineers" was appointed to follow the development of the steam turbine during the coming year and report the results at the next convention. This committee was known as the Committee for the Investigation of the Steam Turbine and consisted of Messrs. Wm. C. L. Eglin of Boston, Fred Sargent of Chicago, and A. C. Dunham. You may remember that the three new General Electric Co. turbines were put into service at the Fisk Station of the Commonwealth Edison Co. during that year.

In 1905 the committee was enlarged to five members, including in addition to Messrs. Eglin and Dunham, I. E. Moultrop, G. W. Cato, and J. D. Andrew.

After its 1906 report the committee asked to be discharged, and in its place there was appointed, under the chairmanship of Mr. Eglin, a Committee on Gas Engines, probably consisting of the same men. A report was presented in 1908. John B. Klumpp of Philadelphia was chairman in 1909, and Mr. Moultrop of Boston in 1910.

The work of these two committees suggested the desirability of organizing a standing committee of broader scope and larger membership, and in 1911 the first report of the Prime Movers Committee appeared. This committee devoted its attention to standard apparatus in use by the various companies. The size of the committee was gradually increased.

At the time** of my introduction to the Prime Movers Committee it consisted of eight or nine members: Messrs. Moultrop, Klumpp, John Hunter of St. Louis, John Sparrow of New York, Harry Wood of Brooklyn, James Graves of Pittsburgh, W. L. Abbott of Chicago. I do not remember the others.



ALEX D. BAILEY

First Committee Experience

As was usually the case, my first experience with the committee consisted of collecting information and preparing reports for my boss, W. L. Abbott, and in the late teens I was made a member of the committee. Ed Ricketts of New York was made a member the following year and after that the size of the committee gradually increased as member companies began to appreciate the value of membership and were anxious to have representatives on the committee.

Dean A. A. Potter and Prof. A. E. White were asked to become members of the committee in the early twenties. Shepard Powell came in later. These were about all the members who were not connected with an operating company.

I can recall my first meeting with the committee in which John Hunter, a bluff, outspoken Scotsman, quizzed me thoroughly on our method of determining coal heat values, and when I had finished a very complete description, he settled me with the remark that "I think that with such a system, anybody could get good operating results," or words to that effect. I was, of course, properly humiliated, but Mr. Sparrow came to my rescue by taking Mr. Hunter on in a two-way argument, and after the latter had described in great detail how he determined coal heat values, Mr. Sparrow made this comment: "John, I don't think your system is worth a damn."

Needless to say, Mr. Sparrow was my good friend forever, and I later learned to have a real affection for John Hunter after I got used to his gruff ways. Ed Ricketts, at his introduction at the next meeting, was given a similar questioning by Harry Wood and was initiated quite as severely as I had been. I cannot remember any similar initiation of a member following this, possibly because there were getting to be too many of the younger generation.

Irving Moultrop stayed with the committee a long time and rendered invaluable service in keeping us from repeating studies which had been made several years before, and telling us where we could find the information we were seeking in previous reports of the committee.

The men who were on the committee when I joined were older men, all of whom were characters in their own right — outspoken and argumentative —and we of the younger generation learned a great deal from them not

* Mr. Bailey was chairman of the NELA Prime Movers Committee during 1925, 1926 and 1927, and of the EEI Prime Movers Committee from its organization as the Power Generation Committee in early 1933 to June, 1934. At the time of his retirement in 1951, Mr. Bailey was vice president in charge of operations and engineering of the Commonwealth Edison Co.

** Mr. Bailey became a member of the NELA Prime Movers Committee in 1915.

only in technical matters, but in personal conduct as well.

I served in my turn as chairman of the committee, and later as chairman of the Engineering Section, which comprised all the technical committees in the association.

As the members of the committee increased, so did the value of its proceedings as it was a place where members could discuss their experiences with various types of equipment and get information from others who already had had such experience. And, although the manufacturers were never allowed to have membership on the committee, the proceedings of the committee were of great value to them, and the committee's annual reports were eagerly sought. At the time NELA was dissolved there were probably 70 members on the committee.

The committee, of course, ended its activities with the dissolution of the association. This was in 1933 when the Edison Electric Institute was started.

The Executive Committee of the Institute was apparently hopeful that that organization and the Association of Edison Illuminating Companies could be combined and consequently set up committees quite similar, or in some cases identical, with those of the AEIC; that is, the Prime Movers Committee was to be called the Power Generation Committee and was to consist of 15 members of higher rank than had been found in the Prime Movers Committee. They apparently did not realize that the old Prime Movers Committee was primarily an educational committee, whereas the Power Generation Committee of AEIC, consisting mostly of officers of the member companies, dealt directly with the manufacturers, bringing to their attention the shortcomings of the various pieces of their equipment and explaining their ideas for future development. The manufacturers, in turn, at annual meetings with the committee, informed the membership of proposed improvements and developments.

It was felt by some of us who had been active in the NELA activities that this new arrangement would not work and, accordingly, a committee consisting of Mark Eldredge of Memphis, Allen Johnson of Buffalo, and me, called on the Executive Committee with the hope that we might explain to the committee why its plan of organization would not work out, giving them the benefit of our experience in committee work in the NELA and requesting that committees be set up quite similar to the old NELA committees which had been functioning so well. They finally agreed to our suggestions and I was asked to be chairman of the new Prime Movers Committee* which was to consist of 26 members. You know how it has grown since then and how it is continuing to carry out the original purpose.

In a short time it has gained in size so that its meetings are now in the convention class.

Do not ever forget that your organization is the envy of every trade organization or association in the country for you represent companies that are non-competitive so you can discuss in the greatest detail your troubles and your accomplishments. You are in a large measure responsible for the tremendous improvements that are characteristic of our industry. Stick to the original concept of the committee and your continued success will be assured.

* The EEI Prime Movers Committee was organized as the Power Generation Committee during the Spring of 1933. Its first meeting was held on June 5 of that year.

Revised Atom Booklet Available from EEI

"ELECTRIC Power from the Atom," a 32-page booklet telling how America's electric light and power companies are advancing in the field of atomic energy, has just been published by EEI, 750 Third Ave., New York 17, N. Y. This edition is the second revision of a booklet issued originally in 1956. Prices range from 25 cents each for one to 99 copies, postpaid in the United States, to 8 cents each for 10,000 or more, FOB, New York.

The booklet points out the following facts:

One hundred and thirty-one of the nation's investor-owned electric companies are participating in 16 atomic power plant construction projects and 11 major research and development programs.

The 16 construction projects will have a combined capacity of about 1,500,000 kilowatts and will cost the companies more than $570 million. Three of the plants are already in operation, nine will be in operation by 1962, and the remainder by the mid-1960's.

In addition, state and local governments or cooperatively owned organizations are participating in the construction of three atomic power plants which will be in operation by 1962. These will have a combined capacity of about 110,000 kw and will require an estimated expenditure of about $32 million.

"Electric Power from the Atom," in concise, non-technical language, tells what atomic energy is, how it is used to make electricity and its significance in the future. The booklet points out that the real importance of atomic energy to power is the assurance it gives that the United States will have ample fuel to meet future power demands. The booklet states that no other nation has a supply of electric power comparable to that of the United States; that this nation has ample generating capacity and can add needed capacity for years to come using our abundant, but not inexhaustible, supplies of conventional fuels.

Included in the booklet is a four-page listing of the electric companies participating in atomic power projects and a map showing the locations of all 30 programs under way in the country. There is also a comprehensive, two-page tabulation of details about all of the construction projects, including the types of reactors involved, the electrical capacities of the plants and their locations, estimated costs to both the participating organizations and the Atomic Energy Commission, and estimated operating dates.

Transmission & Distribution Committee Meeting

- *Potomac Electric's Transmisssion Lines Plans*
- *Report on Ventricular Fibrillation*
- *Problems of Utility Right-of-Way Men*

W. M. PENNEY
Chairman

THE spring meeting of the Transmission & Distribution Committee was held May 7 and 8 at the Shoreham Hotel, Washington, D. C., with 210 members and guests in attendance.

Standards and Specifications

F. C. Marschner, Chairman of the Standards and Specifications Subcommittee, called on task force chairmen for reports of their activities.

C. E. Topping reported that the EEI-NEMA Joint Committee on Pole Line Hardware now is making good progress on proposed new specifications for insulated clevises, secondary extension brackets and aerial cable hangers and revisions of existing specifications for spool type secondary racks and washers.

F. E. Sanford referred to the recently published "Tentative Specifications for Connectors for Aluminum Conductors," EEI Publication No. 59-70, and discussed plans for further work leading toward development of an expanded, revised edition.

W. H. Johnson announced publication of TD-95, "Specifications for Wood Ground Wire Moulding." The Timber Products Task Force now is completing work on proposed reports on standing pole inspection methods and reuse of poles.

A. T. Green announced publication of TDJ-148, "EEI-NEMA Suggested Standards for Future Design of Luminaire Head to Receive External, Locking Type Unit Control." The EEI-NEMA Joint Committee on Standardization of Street Lighting Equipment now is concentrating its efforts on developing a new standard for photoelectric controls and revising the existing standard for street lighting poles.

R. M. Grogan discussed plans to attempt standardization of No. 4 aluminum service drop cable.

H. MacVaugh described progress of the project to provide for interchangeability of aluminum conductor compression connector tools and fittings.

Overhead

R. Hicock, Chairman of the Overhead Subcommittee, sponsored a session featuring discussion of a variety of transmission line problems and developments.

D. C. Vaughan described long range transmission line plans of the Potomac Electric Power Co. which have been complicated by right-of-way problems in the rapidly expanding Washington, D. C., metropolitan area. These call for a 230-kv system bus with an ultimate capacity of 1,500 mva which will extend in a crescent skirting the built-up area between new major generating plants at the northwest and southeast extremities of the service area. This line will consist of two double-circuit tower lines on a single 250-ft. right-of-way.

P. S. Dean and H. Humphries explained the plan used by The Connecticut Light & Power Co. to erect a four-circuit, 115-kv tower line on an 80-ft. right-of-way to replace an existing tower line carrying two 69-kv and two 28-kv circuits. The new towers were built in a step-by-step process straddling the existing towers.

R. Hicock reported that the tree growth control research project now is underway at Battelle Memorial Institute.

P. Stemmler outlined the transmission line maintenance program of The Hartford Electric Light Co. Features include a monthly patrol by helicopter and an annual test of all insulators. Pileated woodpeckers have been discouraged by applying one-half inch galvanized mesh to the entire pole surface from the top down to a point 20 feet above ground.

H. A. Brown told how the Rochester Gas and Electric Corp. used aluminum-sheath, gas-filled aerial cable for a 9,000-ft. section of a 36-kv tie line between two substations where it traverses a heavily treed, high-grade residential section. The weight saving provided by this type cable permitted its installation on poles already carrying 4-kv distribution, street lighting circuits and telephone cable.

Safety

H. MacVaugh, Chairman of the Safety Subcommittee, introduced Dr. W. B. Kouwenhoven, Johns Hopkins University, who discussed progress in the use of electric countershock to revive hearts in a state of ventricular fibrillation as a result of accidental electric shock.

Dr. Kouwenhoven explained that ventricular fibrillation occurs when the nerve centers controlling the heart muscles receive an amount of current just sufficient to upset their normal signals so that the heart muscles work independently at random with each other and do not pump blood through the heart. Larger currents will hold these muscles completely contracted and the heart usually resumes normal beating when the current is broken.

Electric countershock consists of a short pulse of current large enough to stop fibrillation by completely contracting the heart muscles. Initially this method was applied to the exposed heart, but present techniques provide for application to the closed chest.

There have been more than 400 successful applications to the closed chest in various hospitals. Progress is being made in developing portable countershock equipment suitable for field use.

Underground

D. F. Tulloch, Chairman of the Underground Subcommittee, sponsored a session covering a variety of subjects.

C. G. Light outlined methods developed to provide underground service to large new shopping centers in suburban areas around Washington, D. C. Both radial and network systems have been used depending on size and layout. Some are supplied from primaries along the rear lot line with platform-mounted transformers

and others have transformers in vaults. Primary feeders are 13.2 kv or 33 kv.

R. A. Markel and R. N. Rau discussed considerations in determining the extent of an aerial to underground changeover used by the Philadelphia Electric Co.

T. C. Duncan described expansion of the 69-kv subtransmission system introduced in Manhattan in 1950 to handle the rapidly increasing load which has tripled in 13 years. The latest addition involves bringing four of an ultimate 12 pipe-type cables across the Queensboro Bridge on cantilevered portions of the lower deck originally used for single-lane car tracks.

J. A. Pulsford emphasized the economies of a two over a three-position high-voltage switch for 34.5 kv network transformers.

R. E. Kroffke described improved cable pulling and reeling equipment used by The Cleveland Electric Illuminating Co. It is an adaptation of wire-tensioning equipment originally developed for overhead transmission line construction. The latest unit will handle six-ton reels, turn them at a rate of 0 to 20 rpm and provide a 20,000-lb. breakaway pull.

A report from L. G. Smith and G. P. Adams described progress on the AEIC-EEI project for field testing extra high voltage cable. This report appears on page 206 of the June, 1959, issue of the EEI BULLETIN.

C. B. Bechtel gave details of an automatic cable scrapping machine developed by the Baltimore Gas and Electric Co. to pull, cut and bundle scrap cable in the field. The trailer-mounted machine will remove 3½-in. lead cable at a rate of 20 feet per minute.

A. B. Craig described methods used to locate leaks in empty pipes installed for pipe-type cables. A freon leak detector was used to pinpoint the leaks after they had been localized to 800-ft. sections.

General Engineering

The closing session was sponsored by C. E. Bathe, Chairman of the General Engineering Subcommittee.

H. L. Davis, Jr. reviewed Federal Communications Commission activities affecting power company use of radio. Of major interest is the forthcoming hearing concerning allocation of frequencies to the various non-government agencies in the entire spectrum from 25 to 890 mc.

H. C. Bingham told how The Cleveland Electric Illuminating Co. simplified conversion of 4.8-kv undergrounded delta to 7.62/13.2-multigrounded wye by using a dual ratio transformer with an externally operated ratio adjuster. A combination of two 2,820-v windings and one 1,980-v winding of two sizes larger wire provides about the same full load losses at either system voltage.

R. H. Taylor cited advance planning, land economic studies and coordination with highway authorities as the principal problems confronting utility right-of-way men. He emphasized the value of early acquisition of future transmission line rights-of-way in assuring availability when needed, protecting against restrictive zoning, lowering costs and maintaining good customer relations.

Considerations in distribution substation location, capacity and arrangement was the subject of a panel discussion. E. A. Fisher stated that practically all new Union Electric Co. substations are provided with two 34-kv supplies even though only one transformer is installed initially. Most outgoing feeders are carried underground for short distances in urban areas.

H. L. Sangster noted that about two-thirds of the Potomac Electric Power Co. system is primary network. He emphasized that deviation from preferred substation location may be worth $10-$20 per foot in terms of losses and loss of capacity.

A. B. Weaver stated that Central Power & Light Co. substations are supplied by 69-kv and 138-kv transmission. Substations supplying the 12.5-kv distribution system are spaced on about three-mile centers in urban areas with 15-mva transformer banks serving three or four No. 4/0 feeders.

C. E. Baugh reported that all new subdivisions outside designated 4-kv areas of the Pacific Gas and Electric Co. are being served at 12 kv from 69-kv or 115-kv transmission. Substation spacing is four to five miles. For the foreseeable future 20- or 30-mva transformers will be used in stations with ultimate capacities of 80 to 120 mva. Overhead trunk feeders will be 397.5 or 715.5 mcm all-aluminum with normal loading ranging from 6,000 to 10,000 kva.

Accident Prevention Committee Meeting

- *Mental Factors at Time of Accidents*
- *Report by New Chairman of Committee*
- *EEI Resuscitation Manual Well Received*

I. R. DOHR
Chairman

APPROXIMATELY 115 members, safety directors, and guests convened at the Biltmore Hotel in Los Angeles, Calif., July 5-8, for the meeting of the Accident Prevention Committee.

The meeting was devoted to a discussion of new methods, techniques, and developments applicable to accident prevention work; review of joint industry standards pertaining to materials and programs involving safety; presentation of subcommittee and liaison reports; and round table discussions on the engineering, economic, and operation aspects of accident prevention work. Particular attention was paid to development of a workable and practical comprehensive stop-shock campaign.

At the Monday morning session after the invocation by the Rev. Harry W. Adams of the First Methodist Church in Alhambra, a welcoming address was given by J. F. Davenport, Executive Vice President of the Southern California Edison Co.

Mr. Davenport suggested that much more attention should be given by the

staff safety personnel in the field to the mental and emotional factors at the time of an accident. He expressed the opinion that these factors are responsible for about three-fourths of the fatal and near-fatal accidents that occur to people engaged in dangerous work which will tolerate but one mistake. Mr. Davenport also suggested that the Accident Prevention Committee conduct a study of the intangible reasons for accidents, including investigation of mental attitudes, emotional disturbances and psychological environment at the time of accidents to determine if some way can be found to minimize these hazards.

S. H. Young, the newly appointed Vice Chairman, presented his report on accident rates and fatalities in the electric utility industry during 1958; the data are obtained by tabulating and analyzing the individual confidential reports that are submitted by the companies after an accident occurs. The outstanding and most gratifying feature of the accident experience in the electric light and power industry during 1958 was the substantial reduction in severity rate. This was due to the reduced number of fatal and permanent total disability accidents. The reduction of fatals in 1958 compared to 1957 was 25.9%.

Electric Shock, Burn Report

The Electric Shock and Burn Report for 1958, prepared by E. Dunbar of the Potomoc Electric Power Co., was presented by J. Scherer. Flash burns reported were 205 in 1957 and 199 in 1958; contact accidents were reported at 184 in 1957, and 161 cases in 1958. The report included a plea for more complete response to the request for information on these injuries.

L. E. Glascow of the Atomics International Division of North American Aviation, Inc. described the safety aspects of the sodium reactor experimental steam electric generating plant in Canoga Park, Calif. He advised that Atomics International is a very safety conscious company as evidenced by the fact it had accumulated 4¼ million manhours without a lost-time accident; one reason why the company is promoting and developing the SRE is that it is inherently safe equipment, both from the point of view of the general public and of operating personnel.

A. J. Naquin, incoming Chairman of the committee, said that safety references in annual reports were an effective method of illustrating the cooperation and interest of top management in accident prevention work. This year, 54 annual reports were examined and 50 of them (93 percent) had either a written or pictorial safety reference, or both.

At a luncheon on Monday to which all members and guests were invited, W. E. Montgomery, Vice President of the Southern California Edison Co., discussed human relations in accident prevention work. He said he felt there was some correlation between the human relationships in the working environment and the accident frequency rate; admittedly adequate statistics are unavailable either to support or contradict this hypothesis. Mr. Montgomery's complete talk appears on page 303 of this issue of the EEI BULLETIN.

On Monday afternoon, in accordance with accepted practice, the subcommittees met independently to discuss their assignments and formulate their reports.

On Tuesday morning the report of the Electric Shock Prevention Subcommittee was presented by its Chairman, J. R. Hanford. The purpose of this subcommittee is to plan and outline an industry-wide campaign for the elimination of injuries and deaths by electric shock and burn.

The report of the Visual Aids Subcommittee was prepared by J. W. Gronbeck, subcommittee Chairman, and presented by L. A. Westrom of the Bureau of Safety. The sound slide film, "Pole Top Pals," originally made in 1945, is still popular and in demand because of the basic principles it portrays in the art of "covering up." J. W. Gronbeck of the New England Electric System and A. L. Dowden of the Liberty Mutual Insurance Co. have prepared new film and a new script for "Pole Top Pals" and copies are available on order from EEI.

R. E. McCann reported that the work of the Uniform Safe Work Practices Subcommittee was progressing satisfactorily.

W. C. Bremner, Chairman of the Resuscitation Subcommittee, stated that the recently published Resuscitation Manual had been well received by the industry. He reported on the new mouth-to-mouth method and showed the film "Rescue Breathing" to illustrate its application. After considerable discussion, the committee voted to recommend endorsement of the mouth-to-mouth method as the preferred method of resuscitation.

Dr. W. B. Kouwenhoven of the John Hopkins University described and displayed a portable closed chest defibrillator manufactured by the Mine Safety Appliances Co., and described a closed chest massage technique—employed thus far only on animals—which will maintain sufficient circulation to keep the brain centers alive while the heart is not beating. It is well known that an electric shock may upset the rhythm of the heart and throw it into a state known as ventricular fibrillation. In this condition the circulation of the blood ceases. Unless the circulation of oxygenated blood is restored within about four minutes, the brain will be irreparably damaged. Ventricular fibrillation may be arrested by sending sufficient current through the heart to contract it; if this is done within two minutes the heart will usually resume normal rhythm, and a life will have been saved.

Heart Cells and Shock

Dr. G. Guy Knickerbocker of the John Hopkins University described the nature of heart cells and their response to electric shock. He said basic research is in agreement with established statistics showing that there is chance of survival from a very brief electric shock, in the nature of 1/60 second duration, or from a very long exposure to electric shock, possibly of several seconds. For the relatively long shock of about one second in duration, fibrillation and ultimate death are almost certain results.

H. J. Metzger, the sponsor, conducted the round table discussion.

H. B. McMahan said the Monthly Safety Package program was now operating satisfactorily and would be continued.

At a luncheon on Wednesday the report on the EEI Convention recently held in New Orleans was presented by A. J. Naquin; a talk on the relative effects of severity and frequency on accident statistics was presented by S. H. Young; and a travelogue on recent meetings of the committee was presented by R. W. White.

12th Round Table Conference to Be Held Sept. 21-23

(*Continued from page* 298)

Mississippi Power & Light Co.; J. Boulet, Training Supervisor—Arizona Public Service Co.; E. L. Smith, Assistant Secretary—The Hartford Electric Light Co.; V. J. Thompson, Asst. Manager of Industrial Relations—Pacific Gas & Electric Co.; H. M. Coulter, Manager of Industrial Relations—Dayton Power & Light Co.; G. Rodman, Supervisor, Education & Training—Commonwealth Edison Co.; G. Brown, Labor Relations Administrator—Long Island Lighting Co.; W. P. Roberts, Manager of Plant Records—Monongahela Power Co.

"To The Customer and Public"—C. W. Goris, Manager, Gary-Heat Division—Northern Indiana Public Service Co.; J. Edwards, Supervisor of Employee Relations—Ohio Power Co.; R. B. James, Manager of Employment & Employee Services—Portland General Electric Co.; W. C. Rhodes, Director of Personnel—Southwestern Public Service Co.; W. M. LaSalle, Gen. Coordinator, Personnel Relations—Ohio Edison Co.; D. R. Stichnoth, Director, Employee Relations—Iowa-Illinois Gas & Electric Co.; R. M. Bigwood, Personnel Director—Otter Tail Power Co.; W. Walker, Personnel Assistant—New York State Electric & Gas Corp.

82 Achievement Awards Presented

(*Continued from page* 316)

Kansas Gas & Electric Co.
- Entire Company 1,068,170
- Ripley Steam Electric Station 2,000,066

Kingsport Utilities, Inc.
- Entire Company 1,000,000

New Orleans Public Service Inc.
- Electric System 1,538,326

Niagara Mohawk Power Corp.
- C. R. Huntley Station 2,000,000

Northern Indiana Public Service Co.
- Michigan City Generating Station 2,000,031

Northern States Power Co.
- LaCrosse Division (Wisconsin Company) ... 2,014,434

Ohio Edison Co.
- Toronto Power Station 1,004,851

Ohio Power Co.
- Western Division 1,000,000
- East Liverpool District 1,365,476
- Bellaire District 1,580,800

Ohio Valley Electric Corp.
- Indiana-Kentucky Electric Corp.—Clifty Creek Station 1,000,000

Oklahoma Gas & Electric Co.
- Entire Company 1,000,000
- Stores Department 1,000,000
- Southern Division Operating Department ... 1,000,000
- Northern Division 1,654,859

Old Dominion Power Co.
- Entire Company 504,660

Pennsylvania Electric Co.
- Northern Division 1,045,304
- Entire Company 1,486,498

Potomac Edison Co.
- Entire Company and Subsidiaries 1,003,376

Potomac Electric Power Co.
- Distribution Engineering Division 1,053,648
- Entire Company 1,009,200
- Purchasing & General Services 1,012,342
- Entire Company 2,070,600

St. Joseph Light & Power Co.
- Entire Company 1,194,943

Southern California Edison Co.
- Southern Distribution Division 1,228,145
- Huntington Beach EDS District 1,006,673

Southwestern Electric Power Co.
- Texarkana Division 1,065,835
- Power Department 2,010,240
- Entire Company 1,003,855

Southwestern Public Service Co.
- Entire Company 1,856,000
- Pecos Valley Division 2,000,000

Texas Power & Light Co.
- Generating Division 1,255,453
- Entire Company 1,055,186

Union Electric Co.
- Entire Company 1,089,806

Virginia Electric & Power Co.
- Chesterfield Power Station 1,006,789
- Richmond Miscellaneous 1,014,354

Wisconsin Power & Light Co.
- Blackhawk & Rock River Generating Stations 1,000,800
- Edgewater Generating Station 1,043,045

People in Power

CLAY C. BOSWELL, President of Minnesota Power & Light Co., has become chief executive officer of the company, succeeding M. L. HIBBARD, Chairman of the Board.

Mr. Boswell joined the company in 1929 as assistant chief engineer, having previously had utility experience in Utah, Idaho and New York City. He later became vice president and chief engineer, and progressed through various other positions until he was named president in 1954.

Mr. Hibbard served as president of Idaho Power Co. prior to becoming president of Minnesota Power & Light Co., a position he held from 1933 to 1954. He will continue as Chairman of the Board and also act in a consulting capacity.

CARL O. CARLSON and JAMES P. HAYWARD have been named Executive Vice Presidents of Atlantic City Electric Co. Mr. Carlson has been senior vice president since 1957 and Mr. Hayward has been commercial vice president since 1958.

Mr. Carlson first was employed by the company in 1926 as a distribution engineer. In 1948 he was appointed superintendent of operations and in 1952 became vice president of that department. Mr. Hayward has been with the utility since 1925. In 1937 he was made distribution engineer and in 1948 he became superintendent of transmission and distribution for Atlantic City Electric.

LEE R. JONES has been elected Executive Vice President of Colorado Central Power Co., in charge of operations, engineering and construction. Mr. Jones joined Colorado Central in 1933 as a line foreman. He was appointed superintendent of the Fort Lupton District in 1935 and district manager in 1941. In 1945 he became district manager of the Englewood District and served in that capacity until his election as vice president of operations in 1947.

EARL G. ARMSTRONG has been named Vice President, Finance, and will continue as Secretary of Colorado Central. He joined Central Louisiana Electric Co., an associate company of Colorado Central, in 1929 as a cost clerk and general bookkeeper. He served as assistant secretary-assistant treasurer of Central Louisiana from 1939 to 1945 and became secretary-treasurer of Colorado Central in 1945.

Mr. Armstrong has been a member of the board of directors of Colorado Central since 1947.

F. WILLIAM BEIER has become Treasurer of Colorado Central and will retain the office of Assistant Secretary. Employed by Public Service Co. of Colorado as a junior accountant from 1940 to 1946, Mr. Beier joined Colorado Central as an accountant in 1946 and became chief accountant of the company in 1947. He was elected assistant secretary-assistant treasurer in 1953 and held this post until his election as treasurer.

JOHN E. LOGAN, Assistant Vice President of Engineering, Jersey Central Power & Light Co. — New Jersey Power & Light Co., has been elected Vice President, Engineering and Generation, of the utilities. Mr. Logan joined JCP&L in 1934 as assistant relay engineer. He then became assistant general superintendent, assistant chief engineer, and manager of power supply. He was named to his previous post in 1957. A graduate of Massachusetts Institute of Technology with a BS degree in electrical engineering, he is a member of the American Institute of Electrical Engineers.

TEMP S. DAVIS, JR., Assistant Manager of the Atlanta Division of Georgia Power Co., has been named Vice President in Charge of the Columbus Division of the company. He succeeds EDWIN M. CLAPP, retired. Mr. Davis joined Georgia Power in 1934 as a lighting engineer. He was named sales manager of the Augusta division in 1935 and two years later sales manager in Rome. In 1951 he was made manager of the community development division in Atlanta and in 1955 became sales promotion manager. A graduate of Tifton A & M, he received a BS degree in electrical engineering from Alabama Polytechnic Institute.

WILLIAM B. SHENK, ARTHUR V. BENSON, and WILLIAM M. PICKETT have been elected Vice Presidents of Florida Power Corp.

Mr. Shenk, General Sales Manager, will be Vice President in Charge of Sales. He joined the company in 1930, and transferred to Virginia Public Service Co. in 1932. Returning to Florida Power in 1944, he joined the new business department, becoming director of commercial development in 1945. He was named general sales manager in 1957.

Messrs. Benson and Pickett, both Division Managers, will become Vice Presidents in division operations. Long-time Vice President J. SHIRLEY GRACY, in charge of industrial relations and sales, will assume the added responsibilities of overall division operations. Mr. Benson will assist him by supervising the Winter Park, Northern, Ocala and Lake Wales Divisions, and Mr. Pickett will supervise the St. Petersburg and Clearwater Divisions. On October 1, W. W. WOLFF, present vice president in charge of division operations, will retire.

Mr. Pickett joined the company in 1925 as bookkeeper, served as district manager and became St. Petersburg Division manager in 1945. Mr. Benson joined Florida Power in 1929 as serviceman, becoming a district manager in 1939. As a division manager he served three divisions, most recently in Winter Park.

L. O. BRADSHAW, Manager of Marketing and Development, has been elected Vice President, Sales, of Mississippi Power & Light Co. He joined the company 13 years ago as agricultural engineer at Cleveland, Miss. In 1948 he was promoted to industrial engineer and transferred to Jackson. He became manager of the agricultural and industrial section in 1950.

C. L. CLAWSON, Secretary-Treasurer of Tucson Gas, Electric Light & Power Co., has been promoted to Vice President and Treasurer of the company. In the utility industry since 1920, Mr. Clawson joined the Tucson properties of Federal Light & Traction Co. in 1936. At the company P. L. ABBOTT was named Secretary and Assistant Treasurer and W. D. BROOKS was appointed Assistant Treasurer.

FISCHER S. BLACK, Editor and Publisher of *Electrical World*, has been named Vice President, Administrative, of Tampa Electric Co. JAMES D. HICKS, General Superintendent of Operations for Tampa Electric, was named Vice President, Operations, of the utility.

Mr. Black had been editor of *Electrical World* since 1948 and editor and publisher since 1954. Before joining EW, he was assistant to the president of Potomac Electric Power Co. He also has worked for the Nantahala Power & Light Co., Tidewater Power Co., and Tallahassee Power Co. He holds a BS in electrical engineering, an LLB, and a master of patent law.

Mr. Hicks joined Tampa Electric in 1939 as a groundman in the transmission department. In 1945 he became substation maintenance foreman. He later became assistant transmission superintendent and then transmission superintendent.

Also at Tampa Electric JOSEPH E. BURRIS, Assistant Superintendent of Operations, has been promoted to General Superintendent.

HARRY HANSON, Treasurer of the New England Electric System, has been named Vice President of the system. He joined NEES in 1918 as a clerk, was promoted to accountant and then assistant treasurer. For the past 24 years he has been treasurer of the system and most of its subsidiaries. Mr. Hanson will continue in his financial post.

CALVIN T. HUGHES has retired as Vice President and Consulting Engineer of The Connecticut Light and Power Co. after more than 40 years with the company. Mr. Hughes joined CL&P in 1918 and held the positions of cadet engineer, assistant engineer, and design and general engineer before being appointed general superintendent in 1939. In 1949 he was elected vice president and, in 1954, became vice president and consulting engineer.

In 1956, Governor Abraham A. Ribicoff appointed Mr. Hughes to a six-man committee to help guide the state's development of peace-time uses of atomic energy. He is also a member of the technical committee of The Yankee Atomic Electric Co.

A Fellow of the American Institute of Electrical Engineers, he is a past chairman of the Connecticut section of the Institute, which he was instrumental in forming. He served as chairman of the EEI Electrical System and Equipment Committee and as a member of the Planning Committee of the Electric Council of New England.

ERNEST L. GROVE, JR., has been named Executive Assistant to Vice President and Treasurer, L. E. Reynolds, The Connecticut Light and Power Co. Mr. Grove joined CL&P in 1949 and served as an accountant on the controller's staff prior to his present promotion. He holds a BA degree from Denison University, an MBA degree from the Wharton School of Finance, and is a graduate of the University of Connecticut Law School.

New assignments have been given four engineers at New England Electric System. OGDEN E. SAWYER, Assistant Chief Engineer, has been appointed Chief Engineer, succeeding EDWARD W. DILLARD who becomes Consulting Engineer. HERBERT R. STEWART, System Electrical Engineer, has been named Senior Engineer and HARRIS BARBER, Assistant Electrical Engineer, assumes Mr. Stewart's post.

Mr. Sawyer has been with the system since 1932 and Mr. Stewart joined NEES in 1934. Mr. Dillard was assistant electrical engineer from 1918 to 1928 and was electrical engineer for the next 20 years. Mr. Barber became electrical design engineer in 1934 and assistant electrical engineer in 1948. He served on the EEI Engineering Executive Committee from November, 1944, until this past June.

DAVID W. LOUCKS has been appointed Manager, Commercial Sales Department, Duquesne Light Co. Mr. Loucks, who has been with Duquesne Light for 33 years, had been director of the Commercial Sales Department prior to this promotion. Since joining the company he has held the positions of director of industrial sales and steam sales, supervisor of industrial electric and steam sales, and power and steam sales engineer.

He has served as president of the National District Heating Association and the Pittsburgh chapter of the American Society of Heating and Air Conditioning Engineers, and is a member of the Engineers Society of Western Pennsylvania and the Illuminating Engineering Society.

CLAUDE A. MULLIGAN, Vice President of Consumers Power Co., has been elected President of the Michigan Electric Association, succeeding HOWARD R. STEVENSON of The Detroit Edison Co.

W. GEORGE LARKE, President of the Edison Sault Electric Co., was elected First Vice President and R. E. DOYLE, Vice President of the Indiana & Michigan Electric Co., Second Vice President.

HOWARD L. CANFIELD, The Detroit Edison Co., was re-elected Secretary-Treasurer.

MISS LOIS FANKHANEL has been appointed Home Service Director of Otter Tail Power Co. Miss Fankhanel is a graduate of Hillsboro High School and received a BS degree in home economics from North Dakota State College in Fargo. She served as home economics instructor in the Devils Lake school system for the past two years and in a similar position at Rugby, N. D., for six years prior to that. Miss Fankhanel will supervise the activities of the company's home service department.

IVER C. DIXON has been named Commercial Manager of Atlantic City Electric Co. He had been manager of residential sales. Mr. Dixon will be in charge of all commercial activities, including district offices, and all commercial, industrial and residential sales, as well as area development. He was employed by the Ohio Power Co. prior to 1925, when he assumed a position with the American Gas and Electric Co. system and served as an auditor traveling to the various subsidiary companies which at that time included Atlantic City Electric. In 1937, he joined ACE as chief clerk in the billing department, and in 1938 was made manager of residential sales.

He is a member of the EEI Sales Division Executive Committee and has served on the Electric Space Heating and Air Conditioning and the former Residential Promotion Committees.

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(Terms expiring 1960)

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(Terms expiring 1961)

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(Terms expiring 1962)

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